

Adolescent Psychiatric Hospitalization and Mortality, Distress Levels, and Educational Attainment

Follow-up After 11 and 20 Years

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Background: Adolescents with early psychiatric hospitalization are likely to be at a significant risk for long-term difficulties.

Objective: To examine early adulthood outcomes of psychiatrically hospitalized adolescents.

Design: Inception cohort recruited from 1978 to 1981 and observed until 2002.

Setting: Northeastern United States.

Participants: Adolescents (aged 12-15 years) from 2 matched cohorts were recruited and assessed repeatedly across 20 years: 70 psychiatrically hospitalized youths and 76 public high school students.

Main Outcome Measures: Death, emotional distress, high school completion, and educational attainment.

Results: Psychiatrically hospitalized youths were significantly more likely to die and to report higher levels of emotional distress. Hospitalized youths were significantly less likely to graduate from high school and complete college and graduate school.

Conclusions: The association between psychiatric symptoms sufficient to result in psychiatric hospitalization during adolescence and later mortality, emotional distress, high school completion, and educational attainment is striking. Further study is needed to identify and understand linkages between adolescent psychiatric impairment and decrements in adult functioning, particularly the processes that may underlie these linkages. Increasing school completion and educational attainment among hospitalized youths may minimize decrements in adult adaptation.

Arch Pediatr Adolesc Med. 2004;158:749-752

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ADOLESCENT PSYCHIATRIC impairment is associated with later psychological difficulties, family and parental stress, and lost economic and occupational opportunity.¹⁻³ Adolescent psychiatric hospitalization affects tens of thousands of individuals and families. More than 103 000 short-term psychiatric hospitalizations, that is, stays of less than 30 days in which a mental disorder was the first listed diagnosis, of youths under 15 years old occurred in 2000.⁴ Despite the considerable social and economic costs associated with psychiatric difficulties and the large number of adolescents hospitalized, little is known about the long-term outcome of hospitalized adolescent psychiatric patients. For the most part, previous studies have been time limited, retrospective, lacked appropriate comparison groups, and had few participants.⁵ Exceptions are other studies based on the current sample; these studies re-

port increased drug use and criminal behavior, lower self-worth, equivocal evidence of no increase in psychological distress, and strong evidence for increased prevalence of insecure attachment organization among adults psychiatrically hospitalized during adolescence.⁶

This study provides a unique opportunity to examine differences in mortality, emotional distress, high school completion, and educational attainment in an inception cohort of psychiatrically hospitalized youths and comparable high school students recruited in adjacent communities from 1978 to 1981 as part of the Adolescent and Family Development Project.⁷ This prospective study, with its comparison group and 20-year follow-up, clarifies and extends previous findings to provide striking data about the long-term decrements in early and mid-adult functioning among adolescents with psychiatric symptoms sufficient to result in psychiatric hospitalization.⁸ Findings are

Table 1. Psychiatrically Hospitalized Youths and a High School Comparison Group

Demographic Characteristic	Hospitalized Youths	High School Youths
Age, y*	14.1 (1.0)	14.5 (.4)
Socioeconomic status†	2.2 (1.0)	1.5 (.68)
Males, No.	39	35
Females, No.	31	41

*Age at recruitment to study. Data are given as mean (SD).

†Hollingshead-Redlich mean 4 factor score; $F_{1,144} = 27.88$; $P < .001$. Data are given as mean (SD).

particularly compelling because they document long-term outcomes among adolescents who had access to the best treatment available at the time and the resources and opportunities associated with middle- to upper-middle-class family economic status. This study examines the long-term early and mid-adult outcomes of youths who were psychiatrically hospitalized as adolescents.

METHODS

PARTICIPANTS

Two subgroups were recruited in a metropolitan area of the northeastern United States from 1978 to 1981: a psychiatrically hospitalized sample and a high school sample.⁷ Relevant institutional review boards continuously approved the research protocol, and both parental consent and youth assent were obtained.

In the hospitalized sample, parents and youths were recruited from a series of consecutive admissions to traditional psychiatric inpatient wards during a 2-year period. Eligibility criteria included age of 11.5 to 16 years and no diagnosis of mental retardation, psychosis, or psychiatric condition attributed to a medical illness. Psychiatrically hospitalized youths ($n=70$, 31 females and 39 males) ranged in age from 11.8 to 15.9 years (mean \pm SD, 14.1 ± 1 years) at recruitment. Diagnoses at admission included mood (eg, depression) and behavioral disorders (eg, oppositional defiant and conduct disorders), comorbid mood and behavioral disorders, and a variety of other diagnoses (eg, anorexia and obsessive-compulsive disorder). Hospital stays ranged from 37 to 921 days (mean, 198 days). The length of stay was highly correlated with insurance coverage ($r=0.90$). All families had medical insurance or an equivalent source of funding for the hospitalization.

The high school cohort consisted of ninth grade students recruited from a public high school in an adjacent community. The ninth-graders ranged in age from 13.8 to 15.8 years (mean \pm SD, 14.5 ± 0.4 years). The high school group ($n=76$, 41 females and 35 males) did not differ from the hospitalized youths on sex, birth order, or age.

Hollingshead-Redlich 4 factor score was calculated from parental report of education and income at cohort inception.⁹ Both samples were middle- to upper-middle-class (mean \pm SD high school family socioeconomic status [SES], 1.5 ± 0.68 ; mean \pm SD hospitalized family SES, 2.2 ± 1 ; $F_{1,144} = 27.88$; $P < .001$). The sample was 97% white and included 1 Asian Caucasian and 4 African American youths (Table 1).

The study had excellent participant retention: 98% of living participants completed items during the follow-up at 25 years of age; 95% of living participants completed measures during the follow-up in their 30s. At the most recent follow-up, par-

ticipation varied by subgroup: 90% (60/66) of living hospitalized participants and 99% (75/76) of living high school students completed the assessment ($F_{1,140} = 4.64$; $P < .05$). Although statistically significant, each subgroup's participation rate is remarkably high.

MEASURES

Trained, certified research assistants assessed participants at 3 time points: recruitment, 11-year follow-up, and 20-year follow-up. Deaths were monitored through newspaper reports and routine follow-up contacts. To assess emotional distress, the Derogatis Symptom Checklist¹⁰ (SCL-90R), a 90-item questionnaire that asks how much discomfort a symptom has caused on a 0 to 3 scale, was modified to ask about discomfort in the previous 6 months and was administered at the 11-year follow-up. The national norm for the mean \pm SD score across items among nonpatients during a 1-week period was 0.31 ± 0.31 . For the assessment of high school completion and educational attainment, participants self-reported their education (coded as less than high school, 1; general equivalency diploma, 2; high school graduate, 3; postsecondary education [some vocational training or college], 4; college graduate, 5; and graduate degree, 6) at the 11- and 20-year follow-ups.

RESULTS

By their mid-30s, 4 hospitalized youths and no high school youths had died ($N=146$; $\chi^2_1 = 4.47$; $P < .05$). One death occurred before the age of 25 years, and 3 deaths occurred between 25 and 35 years of age. Causes of death included accident, suicide, and a behaviorally related infectious disease.

At 25 years of age, the psychiatrically hospitalized youths reported significantly higher emotional distress on the SCL-90R emotional distress item than did the high school youths ($F_{1,139} = 9.55$; $P < .01$) (mean \pm SD of hospitalized youths, 0.82 ± 0.59 ; mean \pm SD of high school youths, 0.57 ± 0.34). Because of differences in SES among hospitalized and high school youths, analyses were repeated within the highest 2 and highest 3 SES groups, with similar results. Among Hollingshead levels 1 and 2, the mean \pm SD score for hospitalized youths was 0.77 ± 0.56 , and for high school youths it was 0.57 ± 0.34 ($F_{1,113} = 5.80$; $P < .05$). Among Hollingshead levels 1 to 3, the mean \pm SD score for hospitalized youths was 0.81 ± 0.56 , and for high school youths it was 0.58 ± 0.35 ($F_{1,129} = 8.32$; $P < .01$). Among the highest SES group, the difference is striking: the mean score \pm SD for hospitalized youths was 0.83 ± 0.53 , and for high school youths it was 0.48 ± 0.28 ($F_{1,58} = 11.11$; $P = .001$). At each level of SES, the hospitalized participant mean was higher than the high school mean. Among hospitalized youths, adolescent family SES and emotional distress at 25 years of age were unrelated ($F_{4,60} = 0.29$; $P = .88$). In regression analysis to clarify and extend previous findings, adolescent hospitalization and sex contributed independently to variance in emotional distress at 25 years of age ($F_{2,138} = 6.83$; $P = .001$), but SES had no significant effect. Each group mean is significantly higher than the national norm for nonclinic samples (clinic vs national norm, $z = 6.87$, $P < .001$; high school vs national norm, $z = 6.31$, $P < .001$), a difference likely related to the difference in reference period (while study participants were

Table 2. Psychiatrically Hospitalized Youths and a High School Comparison Group: Mortality, Emotional Distress, and Educational Attainment in the Adult Years*

Dependent Variable	Hospitalized Youths	High School Youths
Deaths, No.	4	0†
Emotional distress,‡ mean (SD)	0.82 (0.59)	0.57 (0.34)§
High school completion	54	91
High school completion (mid-adult)	61	93†
Bachelor's degree (mid-adult)	6	70
Graduate degree (mid-adult)	2	33

*Data are given as percentages unless otherwise indicated.

† $P = .05$.

‡Derogatis Symptom Checklist¹⁰ mean item score.

§ $P < .01$.

|| $P < .001$.

asked about symptoms during the previous 6 months, national norms are based on symptoms for a 1-week period) (Table 2).

Extending earlier findings to a larger sample and a longer period, we found that hospitalized youths were less likely than nonhospitalized youths to complete high school (N=141; 54% vs 91%; $\chi^2_1=20.01$; $P<.001$ by 25 years of age) (N=134; 61% vs 93%; $\chi^2_1=17.67$; $P<.05$ by 34 years of age).⁸ Hospitalized youths were less likely to complete college (N=140; 6% vs 70%; $\chi^2_1=55.95$; $P<.001$) and graduate school (N=140; 2% vs 33%; $\chi^2_1=22.55$; $P<.001$). Between the ages of 25 years and mid-30s, significantly fewer hospitalized youths reported increases in degree attainment (3 reported a high school diploma; 2 reported a college degree) (N=126; $\chi^2_1=3.86$; $P<.05$). In contrast, 16 high school youths earned a graduate degree, and 2 earned a college degree.

COMMENT

This study provides a unique opportunity to study and compare 11- and 20-year outcomes of psychiatrically hospitalized adolescents and economically similar high school students, matched on sex, family birth order, and participant age. This study is particularly important because the sample is distinguished by exceptionally high long-term participation: 95% of living participants provided information for the 20-year follow-up.

Outcome differences for hospitalized and high school youths are striking given that the hospitalized group received state-of-the-art psychiatric care at a university teaching hospital, including psychoeducational testing, family therapy, and extensive individualized discharge planning. Increased mortality and emotional distress and decreased high school, college, and graduate school completion highlight the ongoing individual and social costs associated with adolescent psychiatric symptoms sufficient to result in hospitalization. The increased mortality was noteworthy, with deaths occurring only among the formerly hospitalized youths and many years after hospitalization.

Clearly, pharmacological management, psychological treatments, and diagnostic standards have improved

What This Study Adds

Adolescent psychiatric hospitalization affects tens of thousands of families, yet little is known about the long-term outcome of adolescents with psychiatric symptoms sufficient to result in psychiatric hospitalization. This prospective study, with its comparison group, 11- and 20-year follow-ups, and 95% participant retention, indicates that hospitalized youths, in comparison with typical high school students, were significantly more likely to die and to report higher levels of emotional distress and were significantly less likely to graduate from high school and complete college and graduate school across time. Findings highlight the need to better understand linkages between adolescent symptoms and hospitalization and linkages among symptoms, hospitalization, learning disabilities, and decrements in later functioning. The well-established association between educational attainment and unemployment, earnings, and occupational prestige suggests that treatment should emphasize school completion and educational attainment as well as symptom alleviation to improve early and mid-adult adaptation.

greatly since participants were recruited in the late 1970s. Lengths of psychiatric hospitalization for adolescents, which were strongly associated with third-party payer benefits in this study, have decreased dramatically. However, the acute and life-threatening nature and overwhelming management demands of some symptoms will continue to necessitate inpatient stabilization for many youths.^{11,12} For such youths, who likely are the most acutely disabled or have parents less able to manage adolescent symptoms and safety, it is crucial to disentangle linkages between adolescent psychiatric hospitalization and outcome. Whether cohort differences are directly associated with hospitalization remains an open question: hospitalization may have a direct effect, may simply be a marker of underlying difficulties (adolescent or family), or may interact with those underlying difficulties.

For adolescents, the crucial issue is what, in addition to symptom alleviation, may improve early and mid-adult adaptation. The well-established connection between educational attainment and unemployment, earnings, and occupational prestige suggests that interventions focused on increasing high school completion and educational attainment may improve adult adaptation.^{13,14} It is important to identify the extent to which (1) co-occurring learning disorders are associated with high school graduation, later educational and economic attainment, and emotional distress in the hospitalized sample and (2) high school completion and additional educational attainment, even if delayed, may improve the long-term adjustment of adults who were psychiatrically hospitalized as adolescents. Future work is indicated to identify school-based interventions (eg, instructional accommodations, evidence-based instructional methods to remediate processing difficulties and learning disabilities, educational case management, and counseling) that enable and facilitate adolescents' completion of high school and advanced education (vocational training or college).

In sum, the findings of this study document the continued vulnerability of maturing youths and suggest a need for mental health services to minimize later emotional distress and mortality, together with educational support to increase high school completion and educational attainment from the time of hospital discharge to early and mid-adulthood.

Accepted for publication April 28, 2004.

Dr Best began this work while supported by a post-doctoral training award from the National Institute of Mental Health, Bethesda, Md, through the Family Risk and Resilience Consortium (MH19734). Current work is made possible by research support from the College of Letters and Science, University of California, Los Angeles. This study was completed with the assistance of grants from the National Institute of Mental Health; the National Institute of Child Health and Development, Rockville, Md; the William T. Grant Foundation, New York, NY; the John D. and Catherine T. MacArthur Foundation, Chicago, Ill; the Spencer Foundation, Chicago; and the Lilly Endowment, Indianapolis, Ind.

We gratefully acknowledge the assistance of many talented and dedicated research associates and staff members since the study's inception in the late 1970s.

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