

Correlates of Mental Health Service Use Among Young Adults With Mental Illness: Results From the National Survey on Drug Use and Health

Shari Miller, Ph.D., Heather Ringeisen, Ph.D., Breda Munoz, Ph.D., Sarra L. Hedden, Ph.D., Lisa J. Colpe, Ph.D., M.P.H., Harley Rohloff, B.S., Venita Embry, M.P.H.

Objective: This study examined correlates of use of outpatient and inpatient mental health services and psychotropic medication in a large, nationally representative sample of young adults ages 18–26 with mental illness (N=22,600).

Methods: Data were from the 2008–2012 National Survey on Drug Use and Health, an annual nationally representative survey of the civilian, noninstitutionalized U.S. population. Separate logistic regression models examined past-year use of three mental health service types (outpatient services, inpatient services, and psychotropic medication). Correlates included demographic characteristics, factors developmentally relevant to young adults, and general medical and mental health status.

Results: Within this sample of young adults with mental illness, 20.4% used outpatient services, 3.6% used inpatient services, and 25.4% used psychotropic medication. Variables associated with use of one or more types of mental health

services included being female (outpatient and medication), one to two moves in the past year (medication), having health insurance (all types), past-year criminal justice involvement (all types), poor health (inpatient and medication), substance use disorders (inpatient and medication), and mental illness with severe impairment (all types). Non-Hispanic blacks, Asians, and Hispanics were less likely than non-Hispanic whites to receive outpatient mental health services or psychotropic medications. Surprisingly, young adults employed full-time were less likely than those who were unemployed to receive services, and living with a partner (versus living alone) was not associated with a likelihood of using outpatient services.

Conclusions: Results support the unique nature of young adulthood and the need to tailor mental health services to close gaps in service use during this developmental period.

Psychiatric Services 2016; 67:642–649; doi: 10.1176/appi.ps.201400486

Mental illness is a leading cause of disability in the United States (1), and initial episodes often occur in young adulthood. Schizophrenia commonly has its onset during this developmental period (2), and one in three individuals with major depressive disorder first receive the diagnosis as young adults (3). Furthermore, serious mental illness exists among 2.4 million young adults (4). Synchronous with this heightened vulnerability to mental illness are challenges with transitioning into adulthood (5). Developmental tasks associated with young adulthood include establishing romantic relationships, securing stable housing, and attaining educational and employment goals (6).

The confluence of mental illness onset and challenging developmental tasks underscores the need to identify factors related to mental health service use among young adults, especially since mental illness can contribute to negative economic and educational outcomes (7).

Consequently, young adults might benefit from developmentally appropriate services to facilitate the transition to adulthood.

Despite having high levels of need, young adults are less likely than members of other age groups to use mental health services, according to national data (8,9). Colleges face increasing numbers of students with mental health problems (10). Despite having access to campus services, only half of college students with mental health problems use supports (11,12). The largest study of mental health service use among young adults compared admissions data from the 1997 Client/Patient Sample Survey (13) for three age groups: six to 15 (pretransition), 16–25 (transition), and 26–35 (posttransition). Outpatient care was significantly more prevalent in the pretransition group compared with the transition or posttransition groups. However, use of inpatient services was lower in the pretransition group compared with the other two groups.

Studies with adults have identified factors associated with service use. Demographic correlates included female gender, age younger than 60, being married, non-Hispanic white race-ethnicity, and residence in a nonrural area (14). Studies show that African Americans (15,16) and Latinos (17,18) are less likely than whites to use mental health services. Other factors related to greater service use include having insurance (19) and employment (20). Less is known about correlates of mental health service use among young adults. As adolescents age into young adulthood, African Americans report worsening mental health problems (21). African-American young adults are also less likely to receive mental health services compared with white young adults (22).

The purpose of this study was to examine rates of service use among young adults with mental illness and correlates of use of mental health services, including outpatient and inpatient services and psychotropic medication. Correlates included demographic and developmental characteristics, level of impairment related to mental illness, and other factors related to service use. Given high levels of unmet need among young adults, we focused on young adults with some indicator of mental health service need rather than a general young adult sample. Attentive to the unique developmental transition among young adults, we focused on correlates with particular salience for this period.

METHODS

Sample

This study analyzed data from 22,600 young adults, ages 18–26, who were identified as having any mental illness and who participated in the 2008–2012 National Survey on Drug Use and Health (NSDUH), a nationally representative survey of the civilian, noninstitutionalized U.S. population (23). NSDUH is conducted annually by the Substance Abuse and Mental Health Services Administration. Face-to-face interviews are conducted with approximately 70,000 randomly selected individuals age 12 or older. Respondents are selected via a multistage area probability sample within each state and the District of Columbia. They provide consent after hearing a detailed study description and are paid \$30 upon completion. Trained interviewers visit households and administer the survey by using computer-assisted interviewing. Procedures were approved by the contracting organization's institutional review board.

Measures

Demographic, developmental, and other correlates. Demographic variables included age, gender, race-ethnicity, and county type (metropolitan and nonmetropolitan). We collected data in four domains that are relevant to service use during young adulthood: current school enrollment (middle or high school student, high school dropout, high school graduate, college student, and college graduate), past-year employment (full-time, part-time, full-time student,

disabled, not in work force, and unemployed), past-year residential stability (zero, one, two, and three or more moves), and current living situation.

The determination of mental illness and impairment level was based on analyses conducted on a subsample of NSDUH's adult respondents who were administered a clinical follow-up study (24,25). This subsample was administered a clinical psychiatric diagnostic interview (Structured Clinical Interview–DSM-IV-TR [SCID] Axis I) (26) in addition to the NSDUH survey. Respondents who received at least one diagnosis of a past-year mental disorder in the clinical interview were considered as having any mental illness. The Global Assessment of Functioning (GAF) score was used to determine functional impairment level among the clinical subsample; adults with any mental illness and a GAF score under 50 were categorized as having serious mental illness. NSDUH data collected for each member of the subsample were then used to construct a prediction model that best fit the SCID data and GAF scores collected from the clinical subsample. The model included the following five variables from the NSDUH survey: the K6 scale of psychological distress (27), the World Health Organization Disability Assessment Schedule for measuring functional impairment (28), past-year major depressive episode, past-year serious thoughts of suicide, and age. Cutpoints were derived to indicate any mental illness and various levels of mental illness severity from the model developed in the clinical follow-up study. This model and cutpoints then were applied to the entire NSDUH sample to classify adults with any mental illness in the past year and, among those with any mental illness, a mental illness with mild, moderate, or serious impairment (serious mental illness) (29,30).

We also examined the presence or absence of co-occurring substance use disorders in the past year (dependence on or abuse of alcohol or illicit drugs) on the basis of criteria in *DSM-IV* (31). Other correlates included past-year criminal justice involvement, health (excellent, very good, good or fair, and poor), and current health insurance provider (private only, Medicaid only, CHAMPUS/CHAMPVA, military insurance only, more than one, other, and uninsured).

Mental health service outcomes. Respondents are asked questions about past-year use of outpatient services (treatment from a therapist, psychologist, psychiatrist, social worker, and counselor and partial-day treatment), inpatient services (overnight stays or longer), and psychotropic medication to treat emotions, nerves, or mental health problems, excluding treatment for substance use disorders.

Data Analysis

Logistic regressions evaluated associations between demographic, developmental, mental illness, and related correlates and three mental health service use outcomes (outpatient services, inpatient services, and psychotropic medication). Correlates were entered in the model simultaneously, and PROC Logistic in SUDAAN, version 11.0, was

TABLE 1. Prevalence of past-year mental health service use among young adults with mental illness, by correlate^a

Correlate	N	Weighted N (thousands)	Outpatient services		Inpatient services		Psychotropic medication	
			%	SE	%	SE	%	SE
Age								
18–20	8,000	2,337	19.6	.6	4.5	.3	23.1	.6
21–23	8,000	2,322	20.8	.6	3.6	.3	25.7	.7
24–26	6,600	2,477	20.8	.8	2.7	.3	27.3	.9
Gender								
Male	8,200	2,753	15.1	.5	3.8	.3	19.5	.6
Female	14,400	4,382	23.7	.5	3.4	.2	29.1	.5
Race-ethnicity								
Non-Hispanic white	14,600	4,516	24.1	.5	3.3	.2	31.8	.5
Non-Hispanic black or African American	2,400	826	13.4	1.0	5.1	.6	12.4	.9
Non-Hispanic Native American/Alaska Native	300	48	11.1	2.1	5.1	2.2	23.6	4.0
Non-Hispanic Native Hawaiian or Other Pacific Islander	100	34	8.8	4.0	4.1	2.1	9.3	3.5
Non-Hispanic Asian	800	340	13.3	1.8	2.6	.7	9.8	1.4
Non-Hispanic more than one race	900	158	21.4	2.3	4.4	1.0	27.4	2.9
Hispanic	3,400	1,214	14.1	.9	3.3	.4	15.3	1.0
County type								
Metropolitan area (large or small)	18,100	6,135	20.8	.4	3.5	.2	24.7	.5
Nonmetropolitan area	4,500	1,001	18.2	.9	3.9	.4	29.6	1.1
School enrollment								
Middle or high school student	1,400	406	19.8	1.5	6.8	1.0	22.5	1.5
College or other postsecondary school student	8,800	2,842	23.7	.6	2.5	.2	25.6	.6
High school dropout	1,700	525	16.4	1.3	6.4	.9	26.9	1.45
High school graduate	8,600	2,575	16.8	.6	4.4	.3	25.2	.7
College graduate	1,900	738	24.2	1.6	.7	.2	26.7	1.8
Employment								
Full-time	8,400	2,670	16.0	.6	2.1	.2	22.7	.7
Part-time	6,200	1,941	22.7	.8	2.9	.3	24.5	.8
Unemployed	3,000	951	18.7	1.0	5.5	.6	24.1	1.1
Disabled, not in the workforce	600	171	50.1	3.1	17.8	2.4	63.3	3.0
Full-time student, not in the workforce	2,300	768	26.1	1.3	3.3	.5	26.9	1.3
Other, not in the workforce (including homemaker and retired)	2,100	634	19.5	1.2	5.4	.7	29.7	1.3
Past-year residential stability								
No moves	10,100	3,319	19.6	.6	3.2	.2	25.9	.7
1–2 moves	9,500	2,960	20.7	.6	3.3	.3	24.4	.6
≥3 moves	2,900	854	22.3	1.2	6.0	.6	26.8	1.2
Living situation								
With parent or grandparent	10,700	3,501	19.1	.5	4.2	.3	23.8	.6
With spouse, significant other, or partner ^b	5,100	1,528	20.7	.8	2.6	.4	29.9	1.0
With roommate or others	3,300	1,075	24.9	1.2	2.4	.4	24.3	1.2
Alone, with child	1,200	392	13.2	1.4	4.5	.9	18.1	1.5
Alone, without another adult	2,400	639	23.8	1.3	3.9	.5	29.7	1.5
Past-year criminal justice involvement								
Yes	2,600	805	21.5	1.1	8.3	.8	29.1	1.3
No	19,900	6,311	20.3	.4	2.9	.2	24.9	.4
Mental illness								
Serious impairment	4,700	1,469	36.6	1.1	8.3	.6	42.7	1.1
Mild or moderate impairment	17,900	5,666	16.2	.4	2.3	.2	20.9	.4

continued

used to account for the complex sample design. Sampling weights were used to yield population estimates. Because we combined five years of survey data, sampling weights were divided by the number of survey years.

Collinearity and Missing Data

Collinearity was investigated by using the variance inflation factor, condition index, variance decomposition proportion, eigenvalues (32–34), and full-versus reduced-model approaches which account for the complex survey design (35). Correlates did not exhibit major collinearity. We also conducted analyses to examine model-level missingness; levels were low (<1.8%). A Bonferroni-Holm adjustment was made across all tests to adjust for type I error associated with correlates (36,37).

RESULTS

Sample Characteristics

Within the full NSDUH sample of young adults (ages 18–26), 18.8% (N=22,600) were estimated to have a mental illness. This subpopulation represents six million young adults with a mental illness in the general population. Within this subpopulation, it is estimated that 79.3% had a mild or moderate mental illness and 20.7% had a serious mental illness. The sample was 38.6% male, 63.3% Caucasian, 17.0% Hispanic, and 11.6% African American. The remainder was non-Hispanic and was from more than one race or Asian, Native American/Alaska Native, or Native Hawaiian or Other Pacific Islander. Age was grouped into three categories: 18–20 (32.8%), 21–23 (32.5%), and 24–26 (34.7%).

Mental health service use rates were 20.4%, 3.6%, and 25.4% for outpatient services, inpatient services, and medication, respectively. Table 1 shows percentages of service use by correlate. Of particular interest are rates of service use among young adults with serious mental illness. Specifically, 63.4% did not receive outpatient mental health services in the past year, and 57.3% did not receive psychotropic medication.

Correlates of Mental Health Service Use

Table 2 shows the multiple logistic regression results. Given NSDUH's large size, statistical power to detect change was very high. Thus many variables were significant, including some with confidence intervals close to 1.0. We focus on results that were significant on the basis of the Bonferroni adjustment and do not report results in which confidence intervals were close to 1.0. The table portrays the adjusted odds ratios (AORs) for the association between the correlates and each of the three types of mental health services.

Outpatient mental health services. The likelihood of outpatient service use was significantly greater for 24- to 26-year-olds versus 18- to 20-year-olds (20.8% versus 19.6%, AOR=1.3), females versus males (23.7% versus 15.1%, AOR=1.6), and residents of metropolitan versus nonmetropolitan areas (20.8% versus 18.2%, AOR=1.2). With the exception of young adults reporting more than one race-ethnicity (21.4%) and non-Hispanic Native Hawaiian or Other Pacific Islanders (8.8%), all groups (11.1%–14.1%) were less likely to receive services compared with non-Hispanic whites (24.1%).

As for developmental correlates, college students (23.7%) and college graduates (24.2%) were more likely than high school dropouts (16.4%) to receive outpatient services (AOR=1.5 and 1.7, respectively). Full-time employees were less likely to receive services compared with those who were unemployed (16.0% versus 18.7%, AOR=.6). Disabled young adults who were not in the workforce were three times more likely to receive outpatient services compared with young adults who were unemployed (50.1% vs. 18.7%, AOR=3.3). One's living situation and past-year substance use disorders were not significantly associated with the use of outpatient services.

Young adults with serious mental illness were more likely to receive outpatient mental health services compared with young adults with mild or moderate mental illness (36.6% versus 16.2%, AOR=2.9). Having health insurance increased the likelihood of outpatient service use, particularly among

TABLE 1, continued

Correlate	N	Weighted N (thousands)	Outpatient services		Inpatient services		Psychotropic medication	
			%	SE	%	SE	%	SE
Overall health								
Excellent, very good, or good	20,200	6,406	20.0	.4	3.0	.2	24.3	.4
Fair or poor	2,400	729	24.2	1.2	8.1	.9	34.9	1.4
Substance use disorder								
Yes	7,600	2,412	21.7	.7	5.3	.4	27.9	.8
No	15,000	4,723	19.8	.5	2.7	.2	24.2	.5
Health insurance								
Private only	11,100	3,555	23.7	.6	2.6	.2	28.4	.6
Medicaid only	3,400	975	21.5	1.0	7.1	.7	30.5	1.1
CHAMPUS, CHAMPVA, or military insurance only	600	177	25.9	2.6	5.0	1.2	31.1	2.7
>1 type	700	212	34.7	2.8	8.8	1.4	40.1	2.8
Other	900	258	15.9	1.9	2.9	.7	21.5	1.9
Uninsured	5,900	1,959	12.4	.6	3.0	.3	15.8	.6

^aData are from the 2008–2012 National Survey on Drug Use and Health.

^bLiving with spouse (44.5%±1.1%) and living with significant other (55.5%±1.1%)

young adults with more than one type of insurance (34.7%) or CHAMPUS/CHAMPVA or other military insurance (25.9%). Past-year criminal justice involvement (versus none) increased the likelihood of receiving outpatient services (21.5% vs. 20.3%, AOR=1.4)

Inpatient mental health services. Unlike the findings for outpatient services, no demographic variables (gender, race-ethnicity, and county type) were associated with inpatient service use. College graduates were less likely than high school dropouts to use inpatient services (.7% versus 6.4%, AOR=.3). Disabled young adults who were not in the workforce were more likely than unemployed young adults to use inpatient services (17.8% versus 5.5%, AOR=2.6). Compared with young adults with mild or moderate mental illness, young adults with serious mental illness had greater likelihood of using inpatient services (2.3% versus 8.3%, AOR=3.4). Other factors that increased the likelihood of inpatient service use were poor (versus good) health (8.1% versus 3.0%, AOR=1.6), past-year criminal justice involvement versus none (8.3% versus 2.9%, AOR=2.0), past-year substance use disorders versus none (5.3% versus 2.7%, AOR=1.7), and having Medicaid (7.1%) or more than one type of insurance (8.8%) versus being uninsured (3.0%) (AOR=2.0 and 2.5, respectively).

Psychotropic medication. Findings for use of psychotropic medication were similar to results for outpatient service use. Full-time employment versus unemployment was associated with decreased likelihood of using psychotropic medication (22.7% versus 24.1%, AOR=.7). Use of psychotropic medication was more likely among disabled young adults who were not in the workforce versus unemployed young adults (63.3% versus 24.1%, AOR=3.6). Serious mental illness, criminal justice involvement, poor health, substance use disorders, and being insured were related to psychotropic

TABLE 2. Correlates of mental health service use among young adults with mental illness

Correlate	Outpatient services		Inpatient services		Psychotropic medication	
	AOR ^a	95% CI	AOR ^a	95% CI	AOR ^a	95% CI
Age (reference: 18–20)						
21–23	1.1	1.01–1.29	.81	.63–1.03	1.18	1.05–1.32
24–26	1.3*	1.1–1.44	.66	.50–.88	1.31*	1.15–1.49
Female (reference: male)	1.6*	1.47–1.83	.89	.72–1.10	1.67*	1.50–1.85
Race-ethnicity (reference: non-Hispanic white)						
Non-Hispanic black or African American	.5*	.39–.55	1.33	.98–1.80	.27*	.22–.31
Non-Hispanic Native American/Alaska Native	.5*	.27–.72	1.01	.38–2.72	.59	.35–1.00
Non-Hispanic Native Hawaiian or Other Pacific Islander	.3	.11–.73	1.15	.38–3.51	.19*	.08–.48
Non-Hispanic Asian	.4*	.32–.60	1.28	.70–2.33	.24*	.17–.33
Non-Hispanic more than one race	.8	.59–1.09	1.04	.61–1.66	.78	.58–1.05
Hispanic	.6*	.49–.69	.99	.74–1.32	.41*	.34–.49
County located in metropolitan area (large or small) (reference: nonmetropolitan area)	1.2*	1.08–1.41	1.04	.79–1.36	.91	.81–1.02
School enrollment (reference: high school dropout)						
Middle or high school student	1.3	.94–1.69	1.19	.76–1.86	.84	.63–1.09
College or other postsecondary school student	1.5*	1.16–1.86	.60	.40–.91	.99	.80–1.22
High school graduate	1.1	.85–1.32	.97	.68–1.37	.92	.76–1.12
College graduate	1.7*	1.3–2.3	.3*	.15–.63	1.02	.77–1.36
Employment (reference: unemployed)						
Full-time	.6*	.5–.8	.5*	.4–.8	.7*	.6–.9
Part-time	1.0	.8–1.2	.7	.5–1.0	.8	.7–.9
Full-time student, not in the workforce	1.2	.9–1.4	.8	.6–1.2	1.0	.9–1.3
Disabled, not in the workforce	3.3*	2.4–4.5	2.6*	1.7–4.0	3.6*	2.6–5.0
Other, not in the workforce (including homemaker and retired)	.9	.8–1.1	1.1	.8–1.6	1.0	.9–1.3
Past-year residential stability (reference: 0 moves)						
1–2 moves	1.0	.9–1.2	1.1	.9–1.4	.9*	.8–.9
≥3 moves	1.2	1.0–1.4	1.5	1.2–2.0	.9	.8–1.0
Living situation (reference: alone, without another adult)						
With parent or grandparent	.8	.7–1.0	.8	.6–1.2	.8	.7–1.0
With spouse, significant other, or partner	.9	.7–1.1	.6	.4–1.0	1.0	.8–1.2
With roommate or others	.9	.8–1.2	.7	.4–1.0	.8	.6–1.0
Alone, with child	1.0	.7–1.5	.6	.3–1.1	1.0	.7–1.4
Past-year criminal justice involvement (reference: no)	1.4*	1.2–1.6	2.0*	1.5–2.5	1.5*	1.3–1.7
Mental illness, serious impairment (reference: mild or moderate impairment)	2.9*	2.6–3.2	3.4*	2.8–4.1	2.8*	2.5–3.1
Overall health fair or poor (reference: excellent, very good, or good)	1.1	1.0–1.3	1.6*	1.2–2.1	1.5*	1.3–1.7
Substance use disorder (reference: no)	1.1	1.0–1.2	1.7*	1.4–2.1	1.2*	1.1–1.3
Health insurance (reference: uninsured)						
Private only	2.0*	1.8–2.3	1.3	1.0–1.8	2.2*	2.0–2.5
Medicaid only	1.7*	1.5–2.0	2.0*	1.4–2.7	2.2*	1.9–2.5
CHAMPUS, CHAMPVA, or military insurance only	2.0*	1.5–2.7	1.8	1.0–3.3	2.2*	1.6–2.8
>1 type	3.3*	2.5–4.4	2.5*	1.6–4.0	3.4*	2.6–4.4
Other	1.2	.9–1.7	1.1	.6–1.9	1.5	1.1–1.9

^a Adjusted odds ratio**p* < .001, after Bonferroni-Holm adjustment

medication use. Unlike results for outpatient and inpatient service use, school enrollment status did not predict medication use.

DISCUSSION

Results highlight low rates of service use among young adults with mental illness across all levels of severity. In

particular, more than six in ten (63.4%) young adults with serious mental illness did not receive outpatient mental health services in the past year, and more than half (57.3%) did not receive psychotropic medication. Future studies should focus on reasons that respondents with mental illness do not access services, particularly those with a seriously impairing mental illness. Although results may be due to respondents not perceiving treatment need, that may be less

likely for those with serious mental illness. Furthermore, mental health service use in this study was based on a minimal definition—receipt of only one past-year service; therefore, it is particularly concerning that a substantial proportion of young adults with serious mental illness did not report service receipt.

Findings revealed that about three in four young adults with a mental illness did not receive outpatient services, and more than half did not receive psychotropic medication. Results call attention to factors unique to young adulthood that differ from the variables addressed in the literature on adults, such as school enrollment. Compared with young adults with mental illness who had dropped out of school, young adults with mental illness who were enrolled in or had graduated from college were more likely to receive outpatient services. Nonetheless, they still experienced challenges, including social isolation and fear of stigma (38). Policies such as withdrawing financial aid if a student is temporarily out of school might interfere with a student returning to college (39). Innovative models to support college students with mental illness to achieve their education goals are needed (38,40).

Our findings highlight correlates of mental health service use that are particularly relevant in young adulthood. The findings related to living situation, which includes living with a spouse or significant other, were unexpected. Studies with older samples indicate that marriage is associated with greater service use (14), although we did not find significant associations between living with a spouse or partner and use of outpatient, inpatient, or psychotropic medication services. This divergence may reflect unique aspects of young adulthood that are intertwined with romantic or marital partners. A recent report indicated that the median age of marriage was 27 for females and 29 for males, the oldest in modern history (41). Marriage or cohabitation does not appear to have the same influence on facilitating service use among young adults as it does in later adulthood. Because a growing number of young adults live with their parents (42), the living situation variable in this study also included living with parents. During childhood, parents are critical for children's services access; however, in this study, young adults who lived with parents were not more likely to use services. Research is needed to understand how parents and romantic partners (including distinctions between marriage and cohabitation) encourage young adults' service receipt.

Another finding that diverged from the literature on mental health service use among adults involved employment. In the adult literature, full-time employment is positively associated with service use (22). However, in this study, individuals who were employed full-time were less likely to use services compared with those who were unemployed. One explanation is that full-time employment among young adults with mental illness is a sign of positive functioning, which may decrease service need. Young adults with mental illness express interest in having careers

and being self-sufficient (38,43). Jobs also signify social acceptance, which can promote self-esteem and quality of life (44). Research is needed to understand factors that promote successful employment and to evaluate programs supporting employment and career development for young adults with mental illness (38).

Some findings were similar to those found in the adult literature, suggesting the generalizability of these correlates across age. Demographic findings were similar to those in the adult literature: females made greater use of outpatient and medication services compared with males, residents of metropolitan counties were more likely to use outpatient services compared with residents of nonmetropolitan counties (14), and African Americans (15,16) and Latinos (17,18) were less likely to use outpatient and medication services compared with non-Hispanic whites. Our results suggest that these factors are overarching correlates of mental health service use across adulthood.

Insurance is an important correlate of mental health service use and is particularly critical for young adults. In this study, having any insurance was associated with outpatient and medication services; having Medicaid and more than one type of insurance was associated with inpatient service use. Compared with adults of other ages, young adults are the most likely to be uninsured (45). Starting at age 18, insurance eligibility varies by multiple factors. Prior to Affordable Care Act (ACA) reforms, only young adults who were students were eligible for parental insurance, and Medicaid eligibility typically ended at age 18 for most young adults. We need to understand the impact of insurance instability discrepancies on young adults' mental health service use, particularly how the changing health care coverage scene, for example changes resulting from implementation of the ACA and mental health parity laws, affects service utilization.

Findings underscore how other service sectors are related to mental health service use. Young adults with criminal justice involvement, poor health, or disabilities were more likely to receive mental health services. More than half of inmates have some type of mental health problem (46); 14.5% of male inmates, and 31.0% of female inmates have a serious mental illness (47). Also, general medical and mental health problems often co-occur (48,49).

Findings revealed that substance use disorders were significantly associated with higher use of inpatient and psychotropic medication services. These results highlight the influence of co-occurring disorders on the likelihood of using inpatient and psychotropic medication services for mental illnesses. However, co-occurring substance use disorders were unrelated to the likelihood of outpatient service use. Seventy-eight percent of respondents with co-occurring disorders did not use outpatient services in the past year. Mental illness and substance use disorders frequently co-occur: more than 65% of participants with lifetime substance use disorders have at least one lifetime mental disorder (50). Findings underscore the importance of integrated treatment

models that address comorbid substance use disorders and mental illness (51).

This study had some limitations. Because NSDUH collects income data at the household level, we could not include individual-level income status. We did not examine differences across age groups, nor did we focus on perceived need for mental health services as a determinant of access. Despite these limitations, the large, population-based sample of young adults with mental illness in NSDUH offers a widely generalizable survey to study service use.

CONCLUSIONS

Mental illness often emerges in young adulthood, making the young adult years an important period to implement mental health treatment. Service use may be impeded by difficulties navigating complex systems and transitioning from child to adult services (38,52–54). Even when mental health services are received, they may not address developmentally relevant needs (55). Promising service models for young adults emphasize specialized transition services that include vocational, independent living, and housing support (56). These results highlight how correlates of mental health service use—education, employment, and living situation—differ among young adults compared with results from the adult literature. Findings reinforce the need to examine correlates that may be unique to young adults. Results support the uniqueness of young adulthood and the need to tailor mental health services to close service use gaps during this period.

AUTHOR AND ARTICLE INFORMATION

Dr. Miller, Dr. Ringeisen, Dr. Munoz, Ms. Rohloff, and Ms. Embry are with RTI International, Research Triangle Park, North Carolina (e-mail: shari@rti.org). Dr. Hedden is with the Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Rockville, Maryland. Dr. Colpe is with the Division of Services and Intervention Research, National Institute of Mental Health, Bethesda, Maryland.

This study was funded under contract 284-2010-0003C (project 0212800.002), which was supported by funding from the National Institute of Mental Health.

The authors report no financial relationships with commercial interests.

Received October 22, 2014; revision received September 9, 2015; accepted October 26, 2015; published online April 15, 2016.

REFERENCES

- Kessler RC, Amminger GP, Aguilar-Gaxiola S, et al: Age of onset of mental disorders: a review of recent literature. *Current Opinion in Psychiatry* 20:359–364, 2007
- McGorry P: Transition to adulthood: the critical period for pre-emptive, disease-modifying care for schizophrenia and related disorders. *Schizophrenia Bulletin* 37:524–530, 2011
- Kessler RC, Birnbaum H, Bromet E, et al: Age differences in major depression: results from the National Comorbidity Survey Replication (NCS-R). *Psychological Medicine* 40:225–237, 2010
- Young Adults With Serious Mental Illness: Some States and Federal Agencies Are Taking Steps to Address Their Transition Challenges. Washington, DC, US Government Accountability Office, 2008. Available at www.gao.gov/new.items/d08678.pdf
- Arnett JJ: Emerging adulthood: a theory of development from the late teens through the twenties. *American Psychologist* 55:469–480, 2000
- Arnett JJ, Tanner JL: *Emerging Adults in America: Coming of Age in the 21st Century*. Washington, DC, American Psychological Association, 2006
- Gibb SJ, Fergusson DM, Horwood LJ: Burden of psychiatric disorder in young adulthood and life outcomes at age 30. *British Journal of Psychiatry* 197:122–127, 2010
- Kessler RC, Demler O, Frank RG, et al: Prevalence and treatment of mental disorders, 1990 to 2003. *New England Journal of Medicine* 352:2515–2523, 2005
- Adults With Mental Illness: Findings From the 2008 National Survey on Drug Use and Health (HHS pub no SMA 10-4614, analytic series A-31). Rockville, Md, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, Center for Mental Health Services, 2010
- Gallager RP: National Survey of Counseling Center Directors, 2010. Available at www.collegecounseling.org/pdf/2010_survey.pdf. Accessed May 28, 2014
- Eisenberg D, Hunt J, Speer N, et al: Mental health service utilization among college students in the United States. *Journal of Nervous and Mental Disease* 199:301–308, 2011
- National Alliance on Mental Illness: College Students Speak: A Survey Report on Mental Health. Available at www.nami.org/collegesurvey. Accessed May 28, 2014
- Pottick KJ, Bilder S, Vander Stoep A, et al: US patterns of mental health service utilization for transition-age youth and young adults. *Journal of Behavioral Health Services and Research* 35:373–389, 2008
- Wang PS, Lane M, Olfson M, et al: Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. *Archives of General Psychiatry* 62:629–640, 2005
- Chapa T: Mental health services in primary care settings for racial and ethnic minority populations. Rockville, Md, US Department of Health and Human Services, Office of Minority Health, 2004
- McGuire TG, Miranda J: New evidence regarding racial and ethnic disparities in mental health: policy implications. *Health Affairs* 27:393–403, 2008
- Lê Cook B, McGuire TG, Lock K, et al: Comparing methods of racial and ethnic disparities measurement across different settings of mental health care. *Health Services Research* 45:825–847, 2010
- Lê Cook B, Barry CL, Busch SH: Racial/ethnic disparity trends in children's mental health care access and expenditures from 2002 to 2007. *Health Services Research* 48:129–149, 2013
- Elhai JD, Ford JD: Correlates of mental health service use intensity in the National Comorbidity Survey and National Comorbidity Survey Replication. *Psychiatric Services* 58:1108–1115, 2007
- Bland RC, Newman SC, Orn H: Help-seeking for psychiatric disorders. *Canadian Journal of Psychiatry* 42:935–942, 1997
- Harris KM, Gordon-Larsen P, Chantala K, et al: Longitudinal trends in race/ethnic disparities in leading health indicators from adolescence to young adulthood. *Archives of Pediatrics and Adolescent Medicine* 160:74–81, 2006
- Broman CL: Race differences in the receipt of mental health services among young adults. *Psychological Services* 9:38–48, 2012
- Results From the 2012 National Survey on Drug Use and Health: Summary of National Findings (HHS pub no SMA 13-4795, NSDUH series H-46). Rockville, Md, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, 2013
- Aldworth J, Colpe LJ, Gfroerer JC, et al: The National Survey on Drug Use and Health Mental Health Surveillance Study: calibration analysis. *International Journal of Methods in Psychiatric Research* 19(suppl 1):61–87, 2010

25. Colpe LJ, Barker PR, Karg RS, et al: The National Survey on Drug Use and Health Mental Health Surveillance Study: calibration study design and field procedures. *International Journal of Methods in Psychiatric Research* 19(suppl 1):36–48, 2010
26. Kott P, Hedden S, Aldworth J, et al: 2013 National Survey on Drug Use and Health: A Revised Strategy for Estimating the Prevalence of Mental Illness (report prepared for the Substance Abuse and Mental Health Services Administration under contract no HHSS283201000003C). Research Triangle Park, NC, RTI International, 2013. Available at www.samhsa.gov/data/2k12/NSDUHrevisedMImethods2012/NSDUHrevisedMImethods2012.pdf
27. Kessler RC, Barker PR, Colpe LJ, et al: Screening for serious mental illness in the general population. *Archives of General Psychiatry* 60:184–189, 2003
28. Rehm J, Üstün T, Saxena S, et al: On the development and psychometric testing of the WHO screening instrument to assess disablement in the general population. *International Journal of Methods in Psychiatric Research* 8:110–122, 1999
29. Mental Health Surveillance Study operations report (2008–2012); in 2012 National Survey on Drug Use and Health: Methodological Resource Book. Rockville, Md, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, 2014
30. 2012 National Survey on Drug Use and Health: Methodological Resource Book. Rockville, Md, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, 2014
31. Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), 4th ed. Washington, DC, American Psychiatric Association, 1994
32. Belsley DA, Kuh E, Welsch RE: Regression Diagnostics: Identifying Influential Data and Sources of Collinearity. New York, Wiley, 1980
33. Hocking RR: Methods and Applications of Linear Models: Regression and the Analysis of Variance. Hoboken, NJ, Wiley, 2003
34. Mandel J: Use of the singular decomposition in regression analysis. *American Statistician* 36:15–24, 1982
35. Liao D, Valliant R: Variance inflation factors in the analysis of complex survey data. *Survey Methodology* 38:53–62, 2012
36. Armstrong RA: When to use the Bonferroni correction. *Ophthalmic and Physiological Optics* 34:502–508, 2014
37. Mundfrom DJ, Perrett JJ, Schaffer J, et al: Bonferroni adjustments in tests for regression coefficients. *Multiple Linear Regression Viewpoints* 32:1–6, 2006
38. Davis M, Delman J, Duperoy T: Employment and careers in young adults with psychiatric disabilities; in Tools for System Transformation for Young Adults With Psychiatric Disabilities: State of the Science Papers. Edited by Davis M. Worcester, University of Massachusetts Medical School, Department of Psychiatry, Center for Mental Health Services Research, Transitions RTC, 2013
39. Campus Mental Health: Know Your Rights: A Guide for Students Who Want to Seek Help for Mental Illness or Emotional Distress. Washington, DC, Judge David L. Bazelon Center for Mental Health Law, Leadership21 Committee, 2008. Available at www.bazelon.org/Portals/0/pdf/YourMind-YourRights.pdf
40. Ellison ML, Rogers ES, Costa A: Supporting the education goals of young adults with psychiatric disabilities; in Tools for System Transformation for Young Adults With Psychiatric Disabilities: State of the Science Papers. Edited by Davis M. Worcester, University of Massachusetts Medical School, Department of Psychiatry, Center for Mental Health Services Research, Transitions RTC, 2013
41. Millennials in Adulthood: Detached From Institutions, Networked With Friends. Washington, DC, Pew Research Center, 2014. Available at www.pewsocialtrends.org/files/2014/03/2014-03-07_generations-report-version-for-web.pdf
42. Fry R: A Record 21.6 Million in 2012: A Rising Share of Young Adults Live in Their Parents' Home. Washington, DC, Pew Research Center, 2013. Available at www.pewsocialtrends.org/files/2013/07/SDT-millennials-living-with-parents-07-2013.pdf
43. Ryan M, Marshall T, Thorburn B, et al: Clients' perceptions of factors related to finding and maintaining employment. *Schizophrenia Research* 86(suppl):S146, 2006
44. Rinaldi M, Killackey E, Smith J, et al: First episode psychosis and employment: a review. *International Review of Psychiatry* 22: 148–162, 2010
45. Todd SR, Sommers BD: Overview of the Uninsured in the United States: A Summary of the 2012 Current Population Survey Report (Office of the Assistant Secretary for Planning and Evaluation [ASPE] issue brief). Washington, DC, ASPE, 2012. Available at aspe.hhs.gov/health/reports/2012/uninsuredintheus/ib.shtml
46. Sarteschi CM: Mentally ill offenders involved with the US criminal justice system: a synthesis. *SAGE Open*, 2013 (doi 10.1177/2158244013497029)
47. Steadman HJ, Osher FC, Robbins PC, et al: Prevalence of serious mental illness among jail inmates. *Psychiatric Services* 60:761–765, 2009
48. Mental Health and Chronic Diseases (issue brief no 2). Atlanta, Ga, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, 2012. Available at www.cdc.gov/nationalhealthyworksites/docs/issue-brief-no-2-mental-health-and-chronic-disease.pdf
49. Jones DR, Macias C, Barreira PJ, et al: Prevalence, severity, and co-occurrence of chronic physical health problems of persons with serious mental illness. *Psychiatric Services* 55:1250–1257, 2004
50. Kessler RC, Nelson CB, McGonagle KA, et al: The epidemiology of co-occurring addictive and mental disorders: implications for prevention and service utilization. *American Journal of Orthopsychiatry* 66:17–31, 1996
51. Kelly TM, Daley DC: Integrated treatment of substance use and psychiatric disorders. *Social Work in Public Health* 28:388–406, 2013
52. Lyons PM, Melton GB: Coping with mental health problems in young adulthood: diversity of need and uniformity of programs; in *On Your Own Without a Net*. Edited by Osgood DW, Foster ME, Flanagan C, et al. Chicago, University of Chicago Press, 2005
53. Callahan ST, Cooper WO: Gender and uninsurance among young adults in the United States. *Pediatrics* 113:291–297, 2004
54. Park MJ, Paul Mulye T, Adams SH, et al: The health status of young adults in the United States. *Journal of Adolescent Health* 39: 305–317, 2006
55. Gilmer TP, Ojeda VD, Fawley-King K, et al: Change in mental health service use after offering youth-specific versus adult programs to transition-age youths. *Psychiatric Services* 63:592–596, 2012
56. Clark H, Deschenes N, Jones J: A framework for the development and operation of a transition system; in *Transition to Adulthood: A Resource for Assisting Young People With Emotional or Behavioral Difficulties*. Edited by Clark HB, Davis M. Baltimore, Brookes, 2000