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Mental Health of Rural Young Adults: Prevalence of Psychiatric Disorders, Comorbidity, and Service Utilization

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ABSTRACT: Few studies estimate rural psychiatric disorder rates. No study has reported either DSM-III-R or DSM IV disorder prevalence and mental health service use among US rural young adults. This paper reports psychiatric disorder prevalence, comorbidity, service utilization, and disorder correlates in a community sample of 536 young adults, aged 19 to 23 years, living in the rural Midwestern US. More than 60% of the sample met criteria for a lifetime disorder. Substance use disorders were most prevalent. Results indicate that young adults living in the rural Midwest demonstrate substantial rates of psychiatric disorder that are comparable to other population groups.

KEY WORDS: psychiatric disorders; prevalence; comorbidity; service utilization; rural Midwestern US.

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INTRODUCTION

The past decade has seen an increasing focus on rural health, and rural mental health in particular. Several journals have devoted special issues to this topic (Brown & Herrick, 2002; Higginbotham, 2001; Muehrer, 1997) and have focused on problems such as barriers to mental health service use in rural communities (Hoyt, Conger, Valde, & Weihs, 1997; McCabe & Macnee, 2002). The past several decades have also been marked by an interest in national studies of the prevalence and correlates of disorder as well as the use of health services for mental disorders. The Epidemiologic Catchment Area Study (ECA; Robins & Regier, 1991), the National Comorbidity Survey (NCS; Judd et al., 1998; Kessler et al., 1997; Kessler, Foster, Saunders, & Stang, 1995; Kessler & Frank, 1997; Kessler et al., 1994a; Kessler, McGonagle, Swartz, Blazer, & Nelson, 1993; Kessler et al., 1994b), and most recently the National Comorbidity Survey Replication (NCS-R; Kessler et al., 2005; Kessler, Chiu, Demler, Merikangas, & Walters, 2005; Wang et al., 2005a; Wang et al., 2005b) have added vastly to our knowledge of psychiatric epidemiology across age groups and regions in the US and have changed how scholars think about psychopathology (Insel & Fenton, 2005).

For example, findings from the NCS and NCS-R indicate that close to 50% of individuals 15 to 54 years old are likely to experience a psychiatric disorder at some time during their life (Kessler et al., 1994b; Kessler et al., 2005). The likelihood of psychiatric disorder is somewhat higher among young adults. More than 60% of young adults aged 19 to 21 in an urban sample (Turner & Gil, 2002) and 52.4% of the 18–29-years olds in the NCS-R had experienced a lifetime disorder (Kessler et al., 2005). No study has reported prevalence of lifetime disorder among US rural young adults.

One surprising finding from these national studies is that the onset of psychopathology is much earlier than had been expected (Insel & Fenton, 2005). For example, the NCS-R found that three-quarters of all lifetime cases of disorder start by age 24 (Kessler et al., 2005), indicating a need to fully examine disorder and its correlates among children and young adults. Previous studies have investigated psychiatric disorder and health service utilization among children aged 9 to 17 years (Angold et al., 2002; Costello et al., 1996a; Costello et al., 1996b; Costello, Farmer, Angold, Burns, & Erkanli, 1997; Farmer, Burns, Phillips, Angold, & Costello, 2003; Farmer, Stangl, Burns,

Costello, & Angold, 1999; Federman, Costello, Angold, Farmer, & Erkanli, 1997; Sung, Erkanli, Angold, & Costello, 2004). However, little is known about rates of psychiatric disorder and factors associated with disorder among rural young adults.

Health service utilization for psychiatric disorders has been an important area of study, both in national studies of psychiatric epidemiology and in investigations focusing on rural mental health. National studies have found that only about 20% (Kessler et al., 1994b) to 40% (Wang et al., 2005b) of people who had a mental health disorder in the past 12 months had received treatment in the past 12 months. These studies also show that type of disorder and extent of comorbidity is associated with service utilization. In the NCS and NCS-R, participants with affective disorders were most likely to receive treatment from a professional, while those with a substance use disorder were least likely to receive treatment. In addition, people with 3 or more disorders were most likely to seek services (Kessler et al., 1994b; Mojtabai, Olfson, & Mechanic, 2002; Wang et al., 2005b). Relative to those living in more urban areas, living in a rural area was associated with being less likely to receive treatment (Wang et al., 2005b). We do not know whether comorbidity and type of disorder is associated with service utilization in rural young adults.

Investigations focusing specifically on rural mental health have addressed a wide range of service utilization issues. The most widely covered issues include barriers to service use (Badger, Robinson, & Farley, 1999; Hartley, Britain, & Sulzbacher, 2002; Hoyt et al., 1997; McCabe & Macnee, 2002; Rost, Fortney, Fischer, & Smith, 2002; Rost, Smith, & Taylor, 1993), modes of service delivery (Badger et al., 1999; Bischoff, Hollist, Smith, & Flack, 2004; Hester, 2004; McCabe & Macnee, 2002), ethical issues related to providing mental health services in small communities (Roberts, Battaglia, & Epstein, 1999; Warner et al., 2005), and characteristics of effective rural mental health service providers (Hovestadt, Fenell, & Canfield, 2002). However, studies of rural mental health have not provided data about the actual rates of service use among young adults with psychiatric disorders who live in rural communities.

The present study reports findings from the Family Transitions Project (Conger & Elder, 1994), a community study of more than 500 rural young adults and their families. More than 80% of the participants in this study lived on either a farm, in the rural countryside, or in a town with fewer than 2500 inhabitants, meeting the most stringent

US Census definition of a rural area (US Census Bureau). Thus, this study sample meets common perceptions as well as census definitions of a rural population. The UM-CIDI (Kessler et al., 1994b; World Health Organization, 1990), a structured diagnostic interview that produces DSM-III-R diagnoses, was used to estimate disorder prevalence, age of onset, and service use. Although DSM-III-R diagnoses are now dated, using the UM-CIDI to assess disorder gave us the rare ability to directly compare results with another sample of urban young adults (Turner & Gil, 2002) and a nationally representative study (Kessler et al., 1994b) because these studies used the same diagnostic interview. Seventeen lifetime and 15 12-month psychiatric disorders were assessed in a cohort of rural young adults who were between the ages of 19 and 23 years when interviewed about disorder. Estimates of comorbidity and health service utilization are also reported. Finally, selected correlates were used to predict risk for disorder.

METHOD

Sample

Study participants originally took part in two related research projects, the Iowa Youth and Families Project (IYFP; Conger & Elder, 1994) and the Single Parent Project (SPP; Simons, Conger, Elder, Lorenz, & Whitbeck, 1996). These two studies employed the same research procedures and measurement strategies. In 1994, the two studies were combined to form the Family Transitions Project (FTP). The IYFP began in 1989. It included 451 white, primarily lower-middle and middle class families recruited through all 34 schools with a seventh grade class in selected communities in eight Iowa counties. Family median income for 1988 was $33,399. This study required that each family include the two biological parents of a seventh grade adolescent (Target, *M* age = 12.7 years, *SD* = .54; 236 females, 215 males), and a male or female sibling. Seventy-eight percent of the eligible families agreed to participate.

The SPP began in 1991 with a sample of 207 families recruited from the cohort of eighth (*M* age = 13.9 years, *SD* = .5) and ninth (*M* age = 14.8 years, *SD* = .5) grade students living in Iowa. Telephone screening calls identified 210 families headed by a mother who had experienced divorce within the two years prior to the study's start. Additionally, this study required that the divorced parents were the adolescent's biological parents, and each family included a sibling. All but three eligible families agreed to participate. The median income for the 207 SPP families was $21,521 in 1990. Approximately half (*N* = 108) of the SPP families had a Target child in the same school grade as the IYFP Target and it was these 108 families that were combined with the 451 IYFP families to form the FTP.

Of a possible 553 Targets (6 Targets had died by 1999), 536 (289 females, 247 males) completed a lifetime diagnostic assessment. These 536 Targets did not significantly differ from the non-assessed Targets on any study variable.

Procedures

Each year from 1989 to 1992, and again in 1994, participating families were interviewed twice in their homes. During the first visit, participants completed informed consent forms and questionnaires. During the second visit, they completed questionnaires and were videotaped during family discussions. In 1995 (M age = 19.4, SD = .5), 1997, and 1999, Targets also completed the Michigan Composite International Diagnostic Interview (UM-CIDI; World Health Organization, 1990) a diagnostic interview that yields DSM-III-R diagnoses. Thus, Targets were between the ages of 19 and 23 when they were interviewed about disorder. Each year, participants were paid approximately $10 per hour for participation.

Measures

Diagnostic interviews. Five hundred Targets (269 females, 231 males) completed the UM-CIDI (World Health Organization, 1990) in 1995. An additional 36 Targets completed the lifetime assessment in either 1997 or 1999. In 1997 and 1999, Targets who had previously completed a lifetime assessment completed interviews assessing disorder that might have occurred during the interval since their last interview. All data collected for each participant by 1999 were used in the present analyses.

The UM-CIDI (World Health Organization, 1990) is a fully structured diagnostic interview that generates DSM-III-R (American Psychiatric Association, 1987) estimates of psychiatric disorder for both adolescents and adults. For each disorder assessed, participants were asked a series of questions intended to assess whether or not they had experienced any of the relevant DSM-III-R symptoms. For example, the series of questions used to assess alcohol dependence includes questions asking "Have you ever felt such a strong desire or urge to use alcohol that you could not resist it or could not think of anything else?" and "Did your use of alcohol ever become so regular that you would not change when or how much you took it, no matter what you were doing or where you were?" Additional questions address other DSM-III-R symptoms as well as symptom onset and recency.

WHO field trials show that the CIDI possesses good reliability and validity (Wittchen, 1994). To further assure reliability, all interviewers underwent a five-day training workshop, all interview materials were double-checked by research staff, and all interviews were audio-taped. Under the supervision of a counseling psychology faculty member, counseling psychology graduate students who were blind to the UM-CIDI diagnoses duplicated the interview schedule using audiotapes for 10% of the sample. There was 100% agreement between field interviewers and the students for symptom counts and diagnoses.

Table 1 lists the 17 disorders assessed for the present study. All of these disorders were diagnosed in all three years with the following exceptions. Post-traumatic stress disorder (PTSD) and alcohol abuse and dependence were first assessed in 1997. Drug abuse and dependence, anorexia nervosa, and bulimia nervosa were assessed in 1999 only. Conduct disorder (CD) was diagnosed only as part of the lifetime assessment.

Health services utilization. Questions contained within the UM-CIDI assessed health services utilization for each disorder. Service utilization was categorized as follows. *Substance use treatment* referred to seeking any services for alcohol or drug use from medical doctors, osteopaths, psychiatrists, psychologists, social workers, nurses, rabbis, priests, ministers, counselors, or self-help groups like Alcoholics Anonymous. *Mental health treatment* referred to hospitalization or outpatient

treatment for symptoms of any mental disorder from a mental health professional (psychologist, psychiatrist, or social worker), including seeking treatment for substance use. *Treatment from any professional* referred to seeking services for symptoms of any mental disorder from a medical doctor, osteopath, nurse, rabbi, priest, minister, or counselor, including seeking treatment from a mental health professional or seeking treatment for substance use.

Selected correlates of disorder. Disorder correlates included factors previously associated with young adult or rural disorder (Forthofer, Kessler, Story, & Gotlib, 1996; Kessler et al., 1997; Kessler et al., 1995). Because there was no variation in age, race, or region of the country, these demographic correlates were omitted. As a measure of rurality, degree of geographic isolation was assessed through parent report in 1991. Parents also reported their income in 1991. All other measures of correlates were based on Target report in 1999. Because most disorder onsets occurred when the Targets were in their teens and still living with their parents, both parental income and Target income were included as possible correlates of disorder. The lowest parent income category (less than $15,000) approximates the US poverty threshold for a family of five (the average size of the study families was five) in 1990 (US Department of Health and Human Services). The lowest category for Target income (less than $9000) approximates 1998 US poverty guidelines for single persons (US Department of Health and Human Services). Gender and perceived quality of physical health were included as correlates. Finally, a set of correlates was assessed that reflect the transitional nature of this time of life; that is, entry into marriage or cohabitation, entry into parenthood, and educational attainment.

Statistical analysis

Disorder prevalence estimates were calculated as percents. Bivariate associations between disorder categories and specific correlates were estimated using logistic regression. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated using SPSS (SPSS Inc, 1999).

RESULTS

Prevalence of disorder and average age of onset

Table 1 presents the lifetime and 12-month prevalence estimates as well as average age of onset for the disorders assessed. Lifetime prevalence is the proportion of young adults who reported ever experiencing the disorder during at least one of the 3 assessment interviews. Twelve-month prevalence is the proportion of young adults who reported experiencing the disorder during the 12 months preceding the 1999 interview.

Overall, 61.4% of these rural young adults experienced at least one of the assessed disorders in their lifetime, and 24.3% experienced at least one disorder in the 12 months prior to the final interview. Alcohol abuse (18.5% lifetime prevalence) and alcohol dependence (19.3% life-

TABLE 1

Lifetime and 12-Month Prevalence of Disorder in Percent (SE) and Average Age of Onset (SD)

	Lifetime Prevalence			*12 Month Prevalence*[a]			*Average Age of Onset*		
Disorder	*Total*	*Females*	*Males*	*Total*	*Females*	*Males*	*Total*	*Females*	*Males*
Affective Disorders									
Major depressive episode[b]	15.1 (1.6)	21.1 (2.4)	8.1 (1.7)	4.2 (.9)	6.5 (1.5)	1.4 (.8)	17.4 (4.1)	17.5 (4.2)	16.9 (3.8)
Manic episode[b]	.7 (.4)	.3 (.3)	1.2 (.7)	.4 (.3)	.4 (.4)	.5 (.5)	18.5 (4.2)	21.0	17.7 (4.7)
Dysthymia[b]	6.3 (1.1)	9.3 (1.7)	2.8 (1.1)	1.9 (.6)	3.1 (1.1)	.5 (.5)	15.9 (3.6)	15.8 (3.7)	16.0 (3.7)
Any affective disorder[b]	16.2 (1.6)	23.2 (2.5)	8.1 (.1.7)	4.6 (1.0)	7.3 (1.6)	1.4 (.8)	17.2 (4.2)	17.3 (4.3)	16.9 (3.8)
Anxiety Disorders									
Panic disorder[b]	2.4 (.7)	3.5 (1.1)	1.2 (.7)	.6 (.4)	.8 (.5)	.5 (.5)	17.9 (4.2)	18.0 (4.1)	17.7 (5.5)
Agoraphobia without panic disorder[b]	2.2 (.6)	2.1 (.8)	2.4 (1.0)	.8 (.4)	.8 (.5)	.9 (.7)	19.2 (4.0)	18.0 (5.0)	20.3 (2.6)
Social phobia[b]	13.1 (1.5)	14.2 (2.1)	11.7 (2.1)	2.9 (.8)	3.4 (1.1)	2.3 (1.0)	15.8 (4.5)	15.3 (4.5)	16.4 (4.5)
Simple phobia[b]	12.5 (1.4)	16.3 (2.2)	8.1 (1.7)	3.3 (.8)	5.4 (1.4)	.9 (.7)	11.8 (5.9)	12.5 (5.9)	10.2 (5.6)
Generalized anxiety disorder[b]	1.5 (.5)	1.4 (.7)	1.6 (.8)	0.0 (.0)	0.0 (.0)	0.0 (.0)	15.0 (6.5)	12.3 (7.1)	17.0 (6.2)
PTSD[c]	4.8 (.9)	7.4 (1.6)	1.7 (.8)	.4 (.3)	.8 (.5)	0.0 (.0)	16.2 (5.1)	16.3 (5.1)	15.7 (6.5)
Any anxiety disorder[b]	25.6 (1.9)	30.8 (2.7)	19.4 (2.5)	6.9 (1.2)	9.6 (1.8)	3.7 (1.3)	13.8 (5.7)	13.6 (5.6)	14.0 (6.1)
Substance Use Disorders									
Alcohol abuse without dependence[c]	18.5 (1.7)	17.5 (2.3)	19.7 (2.6)	8.4 (1.3)	7.7 (1.7)	9.2 (2.0)	18.6 (2.3)	18.3 (2.2)	18.9 (2.4)

TABLE 1 (*Continued*)

Disorder	*Lifetime Prevalence*			*12 Month Prevalence*[a]			*Average Age of Onset*		
	Total	*Females*	*Males*	*Total*	*Females*	*Males*	*Total*	*Females*	*Males*
Alcohol dependence[c]	19.3 (1.7)	10.2 (1.8)	30.1 (3.0)	5.4 (1.0)	3.1 (1.1)	8.3 (1.9)	18.8 (1.9)	18.7 (2.3)	18.8 (1.8)
Drug abuse without dependence[d]	4.6 (1.0)	3.1 (1.1)	6.5 (1.7)	2.1 (.7)	1.1 (.7)	3.2 (1.2)	18.5 (2.2)	18.8 (2.2)	18.4 (2.2)
Drug dependence[d]	4.6 (1.0)	1.9 (.9)	7.8 (1.8)	1.7 (.6)	.8 (.5)	2.8 (1.1)	19.1 (1.6)	18.6 (1.5)	19.2 (1.6)
Any substance abuse/ dependence[c]	39.9 (2.1)	29.5 (2.7)	52.3 (3.2)	16.1 (1.7)	11.9 (2.0)	21.2 (2.8)	18.7 (2.1)	18.4 (2.2)	18.9 (2.1)
Other Disorders									
Antisocial personality[b]	3.5 (.8)	1.7 (.8)	5.7 (1.5)	NA	NA	NA	NA	NA	NA
Conduct disorder[b]	13.1 (1.5)	5.2 (1.3)	22.3 (2.7)	NA	NA	NA	NA	NA	NA
Anorexia nervosa[d]	.2 (.2)	.4 (.4)	0.0 (.00)	0.0 (.00)	0.0 (.00)	0.0 (.0)	17.0	17.0	NA
Bulimia nervosa[d]	.4 (.3)	.8 (.5)	0.0 (.00)	.4 (.3)	.8 (.5)	0.0 (.0)	16.5 (.7)	16.5 (.7)	NA
Any Disorder[b]	61.4 (2.1)	56.4 (2.9)	67.2 (3.0)	24.3 (2.0)	24.5 (2.7)	24.0 (2.9)	16.1 (4.8)	15.2 (5.0)	17.1 (4.3)

[a]Prevalence for all 12-month disorders based on n = 478 (females n = 261, males n = 217).
[b]Lifetime prevalence and average age of onset based on n = 536 (females n = 289, males n = 247).
[c]Lifetime prevalence and average age of onset based on n = 524 (females n = 285, males n = 239).
[d]Lifetime prevalence and average age of onset based on n = 478 (females n = 261, males n = 217).

time prevalence) were the most common disorders among these rural young adults. A remarkable 39.9% of the sample reported some lifetime substance-related disorder compared to 25.6% for an anxiety disorder and 16.2% for an affective disorder. Anxiety disorders were most likely to surface at younger ages (average age of onset = 13.8), while affective disorders (average age of onset = 17.2) and substance use disorders (average age of onset = 18.7) were likely to surface later. The average age of onset varies a great deal, ranging from 11.8 years for simple phobia to 19.1 years for drug dependence.

Comorbidity

Table 2 provides information about comorbidity. As shown in column 2, slightly less than 40% of the sample reported no lifetime disorder and 31% reported one lifetime disorder, while slightly more than 15% of the sample had two lifetime disorders and nearly 15% of the sample had 3 or more lifetime disorders. Columns 3 and 4 provide information about the proportion of *disorders* that occur solo versus with other disorders. (Thus, column two provides information about the proportion of the *sample* that experiences comorbidity, while columns 3 and 4 provide information about the proportion of *disorders* that occur comorbidly.) Column 3 indicates that over 50% of all lifetime disorders were accounted for by respondents with 3 or more disorders. Indeed, the great majority (76.2%) of the 697 lifetime disorders diagnosed in the present study occurred as comorbid disorders. Finally, the fourth column in Table 2 shows that 70.1% of the 12-month disorders in this sample occurred to participants with 3 or more lifetime disorders. These findings are consistent with results of prior epidemiological

TABLE 2

Concentration of Disorders among Persons with Lifetime Comorbidity (SE)

Number of Disorders	*Proportion of Sample*	*Proportion of Lifetime Disorders*	*Proportion of 12-Month Disorders*
0	38.6 (2.1)		
1	31.0 (2.0)	23.8 (1.6)	14.3 (2.0)
2	15.7 (1.6)	24.1 (1.6)	15.6 (2.0)
3 or more	14.7 (1.5)	52.1 (1.9)	70.1 (2.6)

surveys which indicate that a minority of individuals with multiple disorders accounts for most of the psychiatric morbidity in the population (Kessler et al., 2005; Kessler et al., 1994b).

Service utilization

Estimates of lifetime health services utilization are presented in Table 3. These estimates show that only 27.1% of the young adults who experienced a lifetime disorder received treatment from a mental health professional, a number that increases to 42.2% when treatment from any professional is included. Among those with 3 or more lifetime disorders, 58.2% received treatment from a mental health professional and nearly three quarters (72.2%) received some kind of professional treatment. Young adults with affective disorders were the most likely to receive treatment from a mental health professional, with slightly more than half (51.7%) of the young adults with an affective disorder having accessed treatment from a mental health professional. In contrast, less than one quarter (21.1%) of those with a substance use disorder had received treatment specific to substance use.

Correlates of Lifetime Disorder

With regard to the correlates of disorder, the results in Table 4 replicate the usual finding that women are more likely than men to expe-

TABLE 3

Lifetime Service Utilization in Percent (SE)

Portion of the sample	*Type of Treatment*		
	Substance use	*Mental health*	*Any professional*
Total sample (N = 536)	10.6 (1.3)	19.2 (1.7)	31.5 (2.0)
No Disorder (N = 207)	3.4 (1.3)	6.8 (1.8)	14.5 (2.5)
Any disorder (N = 329)	15.2 (2.0)	27.1 (2.5)	42.2 (2.7)
Affective disorder (N = 87)	12.6 (3.6)	51.7 (5.4)	73.6 (4.8)
Anxiety disorder (N = 137)	12.4 (2.8)	29.9 (3.9)	52.6 (4.3)
Substance disorder (N = 209)	21.1 (2.8)	29.7 (3.2)	40.7 (3.4)
Two or more disorders (N = 163)	19.0 (3.1)	40.5 (3.9)	58.3 (3.9)
Three or more disorders (N = 79)	27.8 (5.1)	58.2 (5.6)	72.2 (5.1)

rience affective or anxiety disorders, whereas men are at greater risk for substance use disorders. Although the degree of rural isolation was not related to disorder, respondents with low current incomes and from families with low incomes demonstrated higher rates of disorder, including greater risk for 3 or more disorders. Consistent with the findings for income, participants with fewer years of completed education were more likely to experience one or multiple disorders. Respondents who rated themselves as having poor to fair physical health were about 4 times more likely to have an affective or anxiety disorder and three times more likely to have 3 or more disorders.

Turning to correlates of special interest for this age group, young adults who were not married or cohabitating were more likely to have a disorder (particularly a substance use disorder) than young adults who were married or cohabitating. However, age of marriage/cohabitation was an influential factor, as young adults who married or began cohabiting as teenagers were more likely to experience a disorder. In addition, teen parents were nearly 4 and one-half times more likely to have an affective disorder compared to respondents who became parents in their 20s.

DISCUSSION

This is the first study of which we are aware to estimate the prevalence of psychiatric disorder in a rural Midwestern community sample of young adults. The results of this research provide evidence of substantial psychiatric disorder in this sample, contrary to frequent perceptions of the US "heartland" as an idyllic region with few mental health problems. Interpretation of the findings must be made with regard to specific study limitations. For example, estimates of lifetime disorder were obtained through retrospective recall. The UM-CIDI (World Health Organization, 1990) does contain memory probes and commitment statements designed to minimize recall error, and the youthfulness of this sample should also reduce memory decay. However, without comparison to studies that prospectively assess disorder from childhood to early adulthood, we cannot know the extent of recall error or memory decay. Also, this was a study of rural Midwestern young adults who are predominantly white. This study's findings may not apply to other rural regions or racial groups. Despite these limitations, the present study contributes to knowledge about prevalence of

disorder, average age of onset, comorbidity, service utilization, and correlates of disorder among young adults living in a rural community.

Prevalence of disorder and average age of onset

More than half of the sample (61.4%) had experienced a lifetime disorder. Comparison with prevalence of disorder in other studies of rural young adults is not possible, as we were not able to identify any other prevalence studies that focused in rural young adults in the United States. However, comparisons can be made with national studies and with one study of Miami-Dade county young adults. Results from the National Comorbidity Survey (NCS) and the Miami-Dade county study are particularly comparable because both studies used the same diagnostic interview as was used in the current study. Comparison to the NCS, which assessed individuals 15 to 54 years of age, reveals that the prevalence of lifetime disorder among the current study's rural young adults is higher than the prevalence of lifetime disorder (48.0%) reported in the total NCS sample (Kessler et al., 1994b). Similarly, the NCS-R reported disorder prevalence of 46.4% for the total sample. Among NCS-R participants between the ages of 18 and 29, lifetime disorder prevalence was 52.4% (Kessler et al., 2005). Prevalence of lifetime disorder among urban 19 to 21 year-olds in Miami-Dade county (Turner & Gil, 2002) reported a comparable rate of lifetime disorder (60.7%).

With regard to 12-month disorder, nearly one quarter of the sample (24.3%) had experienced a disorder within the 12 months preceding their final interview. This number is substantially lower than the prevalence of 12-month disorder found in young adults in Miami-Dade county (38.0%; Turner & Gil, 2002), but similar to the 12-month prevalence rates reported in the NCS (29.5%; Kessler et al., 1994b) and NCS-R (26.2%; Kessler et al., 2005). In addition, the NCS found that young adults are among the most likely to meet criteria for a 12-month disorder (Kessler et al., 1994b) and the NCS-R reported that individuals living in a rural area are less likely than urban residents to report current disorder (Kessler et al., 2005).

Age of onset findings suggest that a substantial majority of the rural young adults in this sample experienced a disorder during their transition to adulthood. In many cases, the disorders they experienced during this time of critical decision making about education, jobs, marriage, and childbearing (Newman et al., 1996) were newly onset, potentially making this transitional period all the more challenging.

TABLE 4

Correlates of Lifetime Disorder

	Any Affective Disorder		*Any Anxiety Disorder*		*Any Substance Use Disorder*		*Any Disorder*		*3 or More Disorders*	
	OR	*95% CI*	*OR*	*95% CI*	*OR*	*95% CI*	*OR*	*95% CI*	*OR*	*95% CI*
Gender										
Male	1.00		1.00		2.62*	1.83–3.76	1.55*	1.09–2.21	.72	.44–1.20
Female	3.46*	2.03–5.89	1.86*	1.25–2.79	1.00		1.00		1.00	
Degree of Isolation										
Farm	1.10	.63–1.91	.89	.35–1.22	.88	.54–1.54	.83	.38–1.06	.93	.41–2.08
Rural countryside	.94	.47–1.91	.65	.55–1.43	.91	.75–1.35	.63	.54–1.27	.79	.41–1.50
Small town	1.00		1.00		1.00		1.00		1.00	
Parents' Income (thousands of $)										
Less than 15	1.43	.60–3.41	2.26*	1.07–4.75	1.17	.59–2.31	1.40	.69–2.80	3.12*	1.26–7.73
15–34.9	1.13	.57–2.25	1.61	.89–2.92	1.04	.62–1.74	1.22	.74–2.02	1.07	.50–2.98
35–69.9	1.05	.53–2.08	1.09	.59–2.00	1.13	.68–1.89	.93	.56–1.52	.90	.41–1.98
70 or more	1.00		1.00		1.00		1.00		1.00	
Income Attainment (thousands of $)										
Less than 9	4.06*	1.30–12.70	4.42*	1.62–12.08	2.96*	1.09–7.99	4.05*	1.25–13.07	2.98	.87–10.23
9–34.9	1.45	.67–3.14	1.05	.59–1.90	1.52	.87–2.63	1.50	.91–2.47	1.45	.62–3.40
35–69.9	1.80	.82–3.98	1.11	.60–2.05	1.51	.85–2.69	1.71*	1.00–2.91	1.15	.47–2.80
70 or more	1.00		1.00		1.00		1.00		1.00	

TABLE 4 (*Continued*)

	Any Affective Disorder		*Any Anxiety Disorder*		*Any Substance Use Disorder*		*Any Disorder*		*3 or More Disorders*	
	OR	*95% CI*	*OR*	*95% CI*	*OR*	*95% CI*	*OR*	*95% CI*	*OR*	*95% CI*
Educational Attainment (years)										
8–12	.95	.49–1.87	1.54	.92–2.60	1.58	.97–2.56	1.94*	1.16–3.23	1.96*	1.00–3.85
13–15	1.38	.83–2.28	1.15	.74–1.79	1.35	.91–2.00	1.38	.93–2.05	2.06*	1.15–3.67
16 or more	1.00		1.00		1.00		1.00		1.00	
Physical Health										
Poor to fair	3.99*	1.79–8.92	4.63*	2.16–9.93	1.08	.50–2.31	3.56*	1.33–9.51	3.09*	1.31–7.28
Good	1.83*	1.10–3.04	1.37	.88–2.14	1.28	.86–1.89	1.29	.86–1.92	1.47	.83–2.56
Very good to excellent	1.00		1.00		1.00		1.00		1.00	
Relationship Status										
Not married/ cohabiting	1.13	.70–1.82	1.22	.81–1.84	1.62*	1.13–2.34	1.53*	1.06–2.22	1.02	.60–1.72
Married/cohabiting	1.00		1.00		1.00		1.00		1.00	
Age at First Marriage/Cohabitation										
Less than 20	2.54	.32–19.94	4.36	.56–34.00	3.38	.74–15.44	3.53*	1.08–11.59	.96	.10–9.56
20 or more	1.00		1.00		1.00		1.00		1.00	
Age at First Birth										
Less than 20	4.46*	1.50–13.26	1.53	.54–4.37	1.87	.66–5.25	2.25	.69–7.38	2.73	.82–9.10
20 or more	1.00		1.00		1.00		1.00		1.00	

*$p < .05$ (two tailed).
OR = odds ratio.

This is particularly true for affective disorders and substance use disorders, with average ages of onset of 17.2 years (for affective disorders) and 18.7 years (for substance use disorders). Twelve-month prevalence rates show that fully one quarter of these rural young adults emerged from this transition continuing to struggle with an active disorder.

Of all disorders assessed, alcohol disorders were the most common, with 37.8% of the sample having a lifetime alcohol use disorder and 13.8% of the sample having a 12-month alcohol use disorder. Nearly half of the males had a lifetime history of an alcohol use disorder, and more than one-fourth of the females had a lifetime history of an alcohol use disorder. Comparing these rates to the prevalence of alcohol disorders in the sample of 19--21-year olds in Miami-Dade county (Turner & Gil, 2002) shows higher lifetime prevalence of alcohol use disorders among the rural young adults (25.1% in the Miami-Dade sample) but slightly lower rural 12-month prevalence (16.4% in the Miami-Dade sample). Both the NCS (Kessler et al., 1994b) and the NCS-R (Kessler et al., 2005; Kessler et al., 2005) reported substantially lower lifetime (NCS: 23.5%; NCS-R: 18.6%) and 12-month (NCS: 9.7%; NCS-R: 4.4%) alcohol disorder prevalences. These comparisons are consistent with previous research indicating that problematic alcohol use often increases during the transition from adolescence to young adulthood (Schulenberg & Maggs, 2002) and alcohol disorders are more prevalent in rural than urban areas (Blazer et al., 1985; Vega et al., 1998).

The magnitude of alcohol disorder in rural young adults is a cause for concern and should be the focus of further research. Most existing research on alcohol use and the development of alcohol use disorders among rural individuals has focused on adolescents who are in high school or younger (Donnermeyer & Scheer, 2001; Federman et al., 1997; Felton et al., 1996; Sung et al., 2004). Given that the average age of onset for alcohol use disorders in the present study was over the age of 18, more research is needed on rural alcohol use and abuse throughout late adolescence and early adulthood.

Comorbidity

The extent of comorbidity in the present study is similar to other studies. In the present study, 30.4% of the sample had 2 or more lifetime disorders as compared to 35.2% in the Miami-Dade sample of young adults (Turner & Gil, 2002), 27.0% in the NCS (Kessler et al., 1994b), and 27.7% in the NCS-R (Kessler et al., 2005). In the present study, approximately half of the participants who met the criteria for

disorder also met the criteria for at least one additional disorder. When considering the proportion of *disorders* that occur solo versus with other disorders, in the present study 52.1% of all lifetime disorders were accounted for by respondents with 3 or more disorders and 70.1% of the 12-month disorders occurred to participants with 3 or more lifetime disorders. These findings are consistent with results of prior research which indicates that a minority of individuals with multiple disorders accounts for most of the psychiatric morbidity in the population (Kessler et al., 2005; Kessler et al., 1994b).

Service Utilization

Findings from the NCS-R indicate that people with disorder who live in rural areas are less likely to utilize services compared to urban residents (Wang et al., 2005b). Only 27.1% of the rural young adults in the current sample who had a disorder received services from a mental health professional and less than half (42.2%) received services from any professional. These proportions are comparable to the lifetime service use reported by the NCS (treatment from a mental health professional: 26.2%, treatment from any professional: 42.0%).

Our finding that the likelihood of seeking services is related both to type of disorder and to comorbidity also agrees with NCS and NCS-R findings (Kessler et al., 1994b; Mojtabai et al., 2002; Wang et al., 2005b). Consistent with these studies, participants with affective disorders were most likely to participate in treatment with any professional, while those with a substance use disorder were least likely to participate in treatment. Also consistent with the NSC and NCS-R, our study found that those most likely to seek services had 3 or more disorders. In the present study, 72% of the rural young adults with 3 or more disorders had sought treatment. This proportion is actually higher than that found in the NCS (Kessler et al., 1994b).

Several scholars have expressed concern about the ability of youth to effectively make the move from child mental health services to adult services (Davis, 2003; Jonikas, Laris, & Cook, 2003; Schulenberg, Sameroff, & Cicchetti, 2004; Vostanis, 2005). These findings, as well as those discussed above, underscore this concern. As noted above, many rural young adults first experienced disorder as adolescents and a substantial proportion continued into young adulthood with at least one and often several disorders. Given that individuals living in a rural area typically have less access to mental health services (Badger et al., 1999; McCabe & Macnee, 2002), a significant question to be addressed

in future research is whether these rural youth with multiple disorders are even more challenged by the need to change from child to adult mental health services than their urban counterparts.

A number of earlier reports discuss barriers to mental health service utilization in rural areas (Badger et al., 1999; Hartley et al., 2002; Hoyt et al., 1997; McCabe & Macnee, 2002; Rost et al., 2002; Rost et al., 1993). Despite these barriers, the present findings indicate that service utilization among these rural young adults, while unacceptably low, is similar to or higher than that found in national samples. These findings may be unique to the state of Iowa or they may reflect greater service use in rural areas than has been thought to exist. A major cause of concern, however, is the high prevalence of alcohol use disorders in this sample in conjunction with the low rate of service utilization among participants with substance use disorders. Research indicates that services for rural adolescents with substance use disorders need to be improved (Anderson & Gittler, 2005), and specialized treatment programs for rural substance abusers are being developed (Clark et al., 2002).

Correlates of lifetime disorder

Research suggests that disorder rates in rural areas should be higher than other areas because several risk factors are prevalent in rural locations, including poor physical health, poverty, low educational attainment, and isolation (Forthofer et al., 1996; Human & Wasem, 1991; Kessler et al., 1997; Kessler et al., 1995; Murray & Keller, 1991; Porter, 1989; Wagenfeld, 1990). While this study cannot compare risk factors across urban and rural areas, the results do generally support the association between these factors and disorder in a rural area. For example, poor physical health was associated with all disorder categories except substance use, and low-income attainment was also associated with almost all disorder categories. While not associated with any particular disorder, limited educational attainment was predictive of having at least one disorder.

The presence of multiple stressors during late adolescence and early adulthood has been used to explain disorder onset during this time period. Dislocations associated with the transition from high school to work or further education are thought to create a significant threat to mental health during this developmental phase (Feehan, McGee, Williams, & Nada-Raja, 1995; Koenig & Gladstone, 1998). Among rural young adults who often must travel long distances to find work or

attend higher education, these dislocations could be particularly stressful. Degree of isolation may be a rough proxy for the extent to which participants needed to travel for work or higher education, and hence may approximate extent of dislocation. In our analyses, isolation was not associated with disorder; however, future research using better measures of dislocation should test the hypothesis that dislocations in the transition to work or higher education contribute to the development of disorder.

Conclusions

This study is the first to report psychiatric disorder prevalence and service use among rural young adults. The results indicate that young adults living in the rural Midwest experience substantial risk for psychiatric disorder. The results do not support the impression that rural citizens enjoy a lower than average risk for disorder. In some instances, such as problems with alcohol, the results indicate that rural young adults may be at even higher than average risk for disorder and are unlikely to receive appropriate treatment. These findings are made all the more useful by our use of a sample of young adults living in areas that meet the US census' most stringent definition of a rural area.

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