

Mothers' Perceptions of Service Use and Unmet Service Needs for Their Adult Offspring With Chronic Mental Illness

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As a result of deinstitutionalization and other changes in the social-political arena, aging parents of adults with chronic mental illness (CMI) are increasingly called on to assume a large portion of the caregiving tasks associated with these illnesses.²⁻⁹ Thus, aging parents, particularly mothers,¹⁰ frequently find themselves at the intersection of the formal and informal systems of care. Because of this role, they have a strong interest in the service needs of their adult children and are generally excellent reporters about those needs.¹¹⁻¹⁵ Evidence that aging parents are concerned with and actively involved in the lives of their adult children with CMI include demands for (1) improved service delivery, (2) better medications and other medical services, (3) partnerships with the treatment team, (4) vocational opportunities, and (5) recreational outlets.^{14,16-20}

Despite the stigma, lack of availability, economic limitations, inadequate staffing by professionals and paraprofessionals, and refusal

on the part of the person with CMI to participate,²¹⁻²⁵ families often seek support from the formal service system.^{16,17,22} Guided by a medical model philosophy, formal services for those with CMI have typically been offered in the form of custodial care²⁶ and acute, crisis-oriented support.²⁷ Although consumers, parents, and professionals cite the need for services that promote successful community integration by increasing functional capacity and psychological stability,^{28,29} these types of support are often less available.^{25,27} As the barriers to service use are lowered, up-to-date information about current service use by and unmet service needs of adults with CMI become critical for the effective use of limited resources. No large studies identify the service needs among community-dwelling persons with schizophrenia.²⁶ This article seeks to clarify the issues related to service use by persons with CMI by providing descriptive information about the current use of services and the extent to which unmet needs for services are reported by aging mothers of adults with schizophrenia. Specific predictors of service use and of unmet need for services are examined within a behavioral model of service use.

CONCEPTUAL FRAMEWORK

Seeking to understand medical service use, Andersen and his colleagues^{1,30,31} proposed that service use can be accounted for by predisposing, enabling, and need factors. This behavioral model has dominated research on service use³² and has been extended by others to include psychosocial service use by caregivers to the elderly.³³⁻³⁷ The model offers heuristic value for

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This research was supported by Grant R01 MH 46849 (Chronically Disabled Adults: Mental Health of Caregivers) from the National Institute of Mental Health and conducted at the Myers Research Institute, Menorah Park Center for the Aging.

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examining service use among adults with CMI as well.

The predisposing component of the model reflects the finding that some people have a greater propensity to use formal services than do others. Such propensities can be predicted prior to the onset of a specific illness episode based solely on current characteristics of the individual. They include race, age, gender, marital status, living arrangements, and attitudes toward and knowledge about the formal service system. Enabling characteristics refer to resources that promote or inhibit service use, such as indicators of socioeconomic status (ie, income, education, employment status), the availability and quality of social support, and the proximity of services. Need characteristics focus on the person with the impairment and include the extent to which behaviors are disruptive, the number of and nature of diagnosed conditions, and functional ability.

Recent research suggests that it is necessary to examine the need for and use of individual services as opposed to the overall need for services.³⁸ Each formal service has several possible barriers associated with its use, such as where it is received (in-home versus in the community), transportation requirements, and participation demands on physical and functional ability. By identifying predictors of the use and unmet need for specific services, outreach efforts can be developed to encourage the use of existing services and to expand the range of services available to adults with CMI.

METHODS

Respondents

Data for the analyses that follow derive from a larger study of the mental health effects on aging mothers who are providing care to unmarried children with chronic disabilities (MH-46849). The analyses focus on the reports of 353 elderly mothers with children who have schizophrenia. Respondents were identified through a variety of community outreach efforts, including public service announcements and other media approaches (42.0%), service organizations (8.2%), family support groups (17.3%), and by nomination from study respondents (32.6%). Personal interviews with the women, most of whom resided in northeast Ohio, were conducted between the spring of 1993 and 1995.

Mothers ranged in age from 50 to 82 (median, 64.4 yrs; SD, 6.9). More than half (57.8%) were currently married, although a sizeable percentage (22.8%) were widows, and 17.7% were divorced. Reflecting the demographics of the geographic region, 89% of the women were white, and 11% were black. Most women could be described as middle class in terms of education (median, 13.4 yrs; SD, 2.4; range, 3-21) and income (median, \$30,000 to \$34,999). In terms of religious affiliation, 48.9% were Protestant, 34.3% were Catholic,

6.3% were Jewish, and 10.6% reported either none or some other religion.

The sons and daughters of the respondents ranged in age from 18 to 55 years, with a mean age of 36.7 years (SD, 6.6). All had received a diagnosis of schizophrenia or met DSM-III-R criteria for schizophrenia based on mother's response to a brief screening instrument. Mothers reported that their child had been ill for an average of 16.6 years, with a range of 1 to 49 years since symptom onset. Approximately one third (33.7%) of those with CMI were living in the mother's home at the time of the interview, with an additional 44.2% living in their own homes or apartments, 12.1% in community programs, 6.2% in long-term care settings, and 2.9% were living with other family or friends. As in previous studies of adults with CMI,^{20,39} the majority of the sample of adults with schizophrenia were men (72.2%). Although gender differences are not thought to occur in the overall incidence rates of schizophrenia, research has found that parents of men with schizophrenia tend to participate in research studies more frequently than do parents of women, possibly because men show an earlier disease onset, have more debilitating symptoms, present a poorer prognosis, and are less likely to have a spouse.²⁵

MEASURES

Predisposing Factors

Race and age were assessed using standard interview questions. Age was coded in years; race was coded "1" for white and "0" for black. Gender of the person with CMI was coded "1" for women and "0" for men. Current living arrangement was coded "1" for in the mother's home and "0" for away from mother's home. Because one method of increasing one's knowledge about services is through institutionalization, prior institutionalization was included as a predisposing factor. Approximately 37% of the adult children had lived in an institution for 4 months at some point in their lives. For most, however, the period of institutionalization was brief (median, 21.6 months; SD, 46.6) and had occurred 8.6 years (SD, 4.5) prior to the interview.

Enabling Factors

Enabling factors included highest level of education, employment status, and mother's annual income. The average level of education among the adults with CMI was 12.8 years (SD, 2.4 years). Approximately one fourth (23.6%) of those with CMI were currently employed. Mother's income, rather than the income of the person with CMI, was used as a measure of economic status because the mother's economic resources reflect the stability of the environment from which the young adult is emerging. A weighted average of mother's household per capita income, household income divided by the number of persons in the household, was computed. Weighting the income measure by the number of persons in the household allowed the

use of comparable scales because household size and total household income varied. The average annual per capita income ranged from \$1000 per person to \$77,500 per person, with a mean of \$16,307 (SD, \$11,719).

Child Need Factors

Pilot work for this study and earlier research¹² suggest that agreement about patient abilities is high between patient and collateral source, thus, only the mothers' reports were gathered. Measures of the number of physical illnesses, functional ability, emotional instability, non-compliance, disruptiveness, withdrawal, confusion, untrustworthiness, odd or peculiar behaviors, violent behaviors, and current crisis status were included.

To assess the number of physical illnesses, a 28-item version of the Health Conditions Checklist was used.⁴⁰ Mothers were asked to report which illnesses and conditions their children had experienced during the past 12 months. Mothers reported between zero and nine illnesses during the past year, with a mean of 1.60 (SD, 1.7) conditions in addition to the diagnosis of schizophrenia. Of note, 21.8% reported that their child had back problems, 17.5% reported chronic bronchitis, 11.4% cited vision problems, 10.2% reported ulcers, and 18.6% reported their child had bladder problems.

Mothers reported on the functional abilities of their son or daughter using the Multilevel Assessment Instrument,⁴¹ in which respondents are asked to indicate whether their child can perform eight instrumental activities of daily living (ie, do housework, prepare meals) and whether the individual does perform each of seven activities of daily living (ie, groom one's self, bathe) without help (3), with some help (2), or not at all (1). The scale ranges from 15 to 45, with higher scores indicating higher functional abilities. The sample mean of 42.15 (SD, 3.2) indicates a high level of functional ability in the offspring with CMI. Coefficient alpha was 0.73.

Because maladaptive behaviors limit an individual's successful integration into the community,⁴² the extent to which maladaptive behaviors characterized the person with CMI during the past month was assessed by asking mothers to report on how often the child engaged in each behavior: frequently (3), occasionally (2), rarely (1), or never (0). All items were subjected to a principal-component analysis, which resulted in eight factors representing 67.8% of the total variance. The factors to emerge mapped closely to those delineated by scales currently in use^{43,44} and included emotional instability, noncompliance, disruptiveness, withdrawal, confusion, untrustworthiness, odd or peculiar behaviors, and violence.

Emotional instability was assessed using a seven-item scale asking the frequency with which the child overestimated his own abilities, reacted poorly to criticism, reacted poorly to frustration, wanted excessive praise, felt persecuted, acted in

hypochondriacal ways, or showed emotional instability. The scale ranged from 0 to 21, with a mean of 6.92 (SD, 7.0). Coefficient alpha was 0.93. Noncompliance was assessed using a five-item scale tapping the frequency with which the child ignored regulations, resisted following instructions, had a rebellious attitude, misbehaved in group settings, or was late or absent from assigned places. The scale ranged from 0 to 15, with a mean of 3.51 (SD, 4.4). Cronbach's alpha was 0.88. Disruptiveness was assessed using a five-item scale asking how often the child has been manipulative or bossy, disrupted others' activities, been inconsiderate, disrespected others' property, or used angry language. The scale ranged from 0 to 15, with a mean of 3.08 (SD, 4.5); Cronbach's alpha was 0.92. Withdrawal was assessed using a three-item scale asking how often the child was shy, withdrawn, or inactive. The scale ranged from 0 to 9, with a mean of 3.59 (SD, 3.2); coefficient alpha was 0.82. Confusion was measured with a three-item scale asking how often during the past month the child seemed afraid, confused, or nervous. The scale ranged from 0 to 9, with a mean of 3.68 (SD, 3.0); coefficient alpha was 0.80. The frequency of untrustworthy behavior was assessed with a two-item scale asking how often the child had lied or cheated and how often the child took others' property without permission. The scale ranged from 0 to 6 (median, 0.49; SD, 1.3); Cronbach's alpha was 0.75. The frequency of odd and peculiar behaviors was assessed with a three-item scale ranging from 0 to 9 (median, 0.94; SD, 2.0). The items asked how often the child had strange and unacceptable habits (ie, hoarding), had strange oral habits (ie, drooled, grinds teeth), and had other eccentric habits (ie, had favorite places to stand, phobias); Cronbach's alpha was 0.70. The frequency of violent behaviors was assessed using a two-item scale asking how often the child threatened to harm others and how often the child had a temper outburst. The mean for the scale, which ranged from 0 to 6, was 0.74 (SD, 1.6); Cronbach's alpha was 0.90.

Nearly one fifth (19.4%) of the mothers reported that their son or daughter was currently in crisis, 79.5% stated that the person with the CMI was not currently in crisis, and a few mothers (1.4%) refused to answer or reported that they did not know whether the adult child was currently in crisis.

Formal Service Use Measures

Mothers were asked to report which of 10 community-based services their children were currently receiving. Services included in-home medical care, dental care, psychological services, social work, specialized training, transportation services, legal assistance, consumer support groups, specialized therapies (physical therapy, occupational therapy, or speech therapy), and recreational services. On average, the children were receiving 4.07 (SD, 2.0; range, 0 to 10) services.

Each mother was also asked to report which

TABLE 1

Means and Correlation Coefficients Related to Service Use and Unmet Service Needs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 Medical Service Use	1																			
2 Psychological Service Use	0.186	1																		
3 Therapy Service Use	0.168	0.123	1																	
4 Dental Service Use	0.05	0.076	0.014	1																
5 Vocational Service Use	0.116	0.115	0.302	0.05	1															
6 Social Work Use	0.276	0.29	0.134	0.055	0.157	1														
7 Transportation Use	0.263	0.162	0.17	-0.01	0.15	0.286	1													
8 Support Group Use	0.185	0.148	0.23	0.023	0.286	0.227	0.238	1												
9 Legal Service Use	0.138	0.142	0.155	0.068	0.072	0.139	0.097	0.162	1											
10 Recreational Service Use	0.182	0.107	0.303	0.144	0.183	0.21	0.253	0.378	0.052	1										
11 Unmet Medical Needs	-0.587	-0.222	-0.123	-0.115	-0.07	-0.222	-0.179	-0.096	-0.117	-0.109	1									
12 Unmet Psychological Need	-0.218	-0.878	-0.106	-0.089	-0.083	-0.269	-0.13	-0.172	-0.123	-0.123	0.249	1								
13 Unmet Therapy Need	0.004	0.013	-0.195	0.043	0.053	-0.03	0.045	0.045	0.114	-0.042	0.095	0.028	1							
14 Unmet Dental Need	0.045	-0.006	-0.011	-0.806	-0.024	-0.012	0.042	0.043	-0.028	-0.102	0.161	0.049	-0.039	1						
15 Unmet Vocational Need	0.017	-0.086	-0.21	-0.038	-0.417	-0.063	-0.102	-0.102	0.017	-0.182	0.085	0.078	0.187	0.095	1					
16 Unmet Social Work Need	-0.284	-0.338	-0.113	-0.082	-0.166	-0.724	-0.215	-0.166	-0.072	-0.194	0.274	0.389	0.075	0.118	0.16	1				
17 Unmet Transportation Need	-0.049	0.056	-0.056	0.003	-0.055	0.032	-0.268	0.097	-0.022	-0.123	0.158	-0.062	0.144	0.039	0.082	0.048	1			
18 Unmet Support Group Need	-0.142	-0.146	-0.175	-0.007	-0.174	-0.142	-0.218	-0.676	-0.068	-0.311	0.124	0.206	0.095	0.031	0.219	0.233	-0.02	1		
19 Unmet Legal Need	-0.082	-0.107	-0.048	-0.098	0.05	-0.102	-0.073	-0.121	-0.104	-0.171	0.094	0.161	0.13	0.118	0.121	0.236	0.137	0.147	1	
20 Unmet Recreational Need	-0.106	-0.103	-0.194	-0.11	-0.115	-0.092	-0.177	-0.224	-0.005	-0.714	0.118	0.118	0.13	0.119	0.296	0.216	0.17	0.346	0.205	1
Means (in percent)	63.5	83.4	7.1	67.1	14.3	75.3	28.5	29	9.3	30.5	15.7	10.6	32.2	22	49.7	12.2	14	51.6	9	52.9

Note: Coefficients greater than 0.140 are significant at the $P < 0.01$ level; coefficients greater than 0.107 are significant at the $P < 0.05$ level.

TABLE 2
Beta and Standard Errors Resulting From Logistic Regressions
for Service Use

	Medical	Dental	Social Work	Support Group	Recreation	Transportation
Predisposing Factors						
Race	0.992 (.503)*	1.288 (.462)†	0.591 (.520)	-0.023 (.470)	0.564 (.547)	0.095 (.530)
Age	0.047 (.023)*	-0.038 (.022)	-0.001 (.025)	0.015 (.022)	0.026 (.024)	0.022 (.025)
Gender	-0.016 (.321)	0.591 (.333)	-0.061 (.354)	-0.005 (.328)	-0.037 (.350)	-0.131 (.364)
Living arrangements	-0.607 (.321)	0.203 (.317)	-1.090 (.352)†	-0.202 (.330)	-0.260 (.345)	-1.244 (.389)†
Prior institutionalization	0.669 (.309)*	0.589 (.306)	1.180 (.381)†	-0.070 (.304)	0.365 (.314)	1.014 (.322)†
Enabling Factors						
Education	-0.064 (.070)	-0.053 (.066)	0.010 (.078)	-0.046 (.068)	-0.022 (.071)	-0.017 (.071)
Employment status	0.103 (.331)	0.484 (.344)	-0.285 (.363)	-0.090 (.346)	0.813 (.353)*	0.086 (.388)
Per capita income	-0.038 (.014)†	0.015 (.014)	0.003 (.016)	0.006 (.014)	0.012 (.013)	-0.029 (.015)
Need Factors						
Physical illnesses	0.196 (.099)*	0.075 (.089)	0.191 (.110)	0.068 (.089)	.043 (.097)	0.152 (.101)
Adaptive functioning	-0.226 (.058)†	-0.009 (.048)	-0.190 (.067)†	-0.099 (.046)*	-0.216 (.051)†	-0.219 (.053)†
Emotional instability	-0.086 (.031)†	0.011 (.029)	-0.059 (.033)	-0.069 (.030)*	-0.074 (.033)*	-0.059 (.033)
Noncompliance	0.090 (.050)	-0.053 (.048)	0.079 (.055)	0.058 (.049)	0.097 (.054)	-0.080 (.058)
Disruptiveness	-0.054 (.055)	-0.029 (.052)	0.036 (.062)	0.056 (.052)	-0.029 (.057)	0.092 (.058)
Withdrawal	-0.016 (.054)	0.018 (.053)	-0.030 (.061)	-0.093 (.055)	-0.043 (.057)	0.038 (.060)
Confusion	0.071 (.061)	0.040 (.061)	0.086 (.070)	0.105 (.062)	-0.053 (.067)	-0.060 (.068)
Untrustworthiness	-0.081 (.137)	-0.198 (.124)	-0.194 (.146)	-0.010 (.123)	-0.141 (.144)	0.025 (.137)
Odd or peculiar behaviors	0.149 (.085)	0.067 (.082)	0.053 (.093)	0.087 (.077)	0.099 (.086)	-0.005 (.091)
Violence	0.114 (.134)	0.051 (.125)	0.118 (.145)	-0.099 (.132)	-0.001 (.146)	0.300 (.150)*
Current crisis status	-0.507 (.425)	-0.327 (.402)	-1.281 (.448)*	-0.487 (.439)	0.045 (.458)	-1.077 (.516)*

Note: * $P < 0.05$; † $P < 0.01$

of these services her child needed. The mean need was for 6.82 (SD, 1.9; range, 0 to 10) services. A composite variable summarizing the discrepancy between perceived need for services and reported receipt of services was calculated for each individual for each service type and then totaled across services. Overall, the mothers reported an average of 2.75 (SD, 2.1; range, 0 to 9) unmet service needs.

RESULTS

Initial analyses examined mothers' reports of services received and the unmet service needs of the sons and daughters. Means, presented with correlations in Table 1, reveal a striking

pattern: although the use of formal services is quite high, considerable service need is still unmet. Based on mothers' reports, the majority of the disabled offspring were currently receiving medical services (63.5%), psychological services (83.4%), dental services (67.1%), and social work services (75.3%). Approximately one third were currently receiving support group services (29.0%), recreational services (30.5%), and transportation services (28.5%). Very few were receiving therapeutic (physical, occupational, or both) services (7.1%), vocational training (14.3%), or legal services (9.3%).

Considerable unmet need was present, especially for vocational training (49.7%), recre-

TABLE 3
Beta and Standard Errors Resulting From Logistic Regressions for Unmet Service Needs

	Dental	Support Group	Recreation	Vocational Training	Therapies
Predisposing Factors					
Race	-1.379 (.479)*	-0.791 (.449)	-0.554 (.469)	0.097 (.456)	-0.407 (.466)
Age	0.037 (.025)	-0.007 (.021)	-0.033 (.021)	-0.016 (.021)	0.013 (.022)
Gender	-0.505 (.375)	-0.249 (.302)	-0.172 (.312)	-0.141 (.304)	-0.220 (.320)
Living arrangements	-0.638 (.373)	-0.009 (.299)	-0.040 (.307)	0.062 (.304)	-0.461 (.322)
Prior institutionalization	-0.812 (.353)†	-0.136 (.281)	-0.425 (.287)	-0.303 (.287)	0.110 (.297)
Enabling Factors					
Education	0.101 (.075)	-0.012 (.063)	-0.069 (.065)	-0.172 (.064)*	-0.071 (.066)
Employment status	-0.611 (.396)	0.255 (.314)	-1.024 (.322)*	-0.996 (.317)*	-0.440 (.352)
Mother's per capita income	0.002 (.016)	0.009 (.012)	-0.009 (.013)	0.005 (.013)	-0.014 (.014)
Need Factors					
Physical illnesses	-0.096 (.100)	-0.005 (.085)	0.078 (.089)	-0.063 (.086)	-0.013 (.086)
Adaptive functioning	0.000 (.053)	0.038 (.045)	0.095 (.046)†	0.126 (.046)*	0.004 (.046)
Emotional instability	-0.048 (.033)	0.039 (.027)	0.038 (.028)	0.007 (.027)	-0.020 (.028)
Noncompliance	0.067 (.054)	-0.056 (.045)	-0.081 (.047)	0.056 (.047)	0.003 (.046)
Disruptiveness	0.057 (.057)	-0.021 (.050)	0.026 (.051)	0.049 (.052)	0.057 (.050)
Withdrawal	-0.083 (.061)	0.181 (.051)*	0.065 (.051)	0.073 (.051)	0.102 (.053)
Confusion	0.075 (.068)	-0.013 (.057)	0.084 (.059)	0.039 (.059)	0.118 (.059)†
Untrustworthiness	0.241 (.128)	-0.052 (.121)	0.070 (.122)	-0.141 (.123)	0.073 (.119)
Odd or peculiar behaviors	0.002 (.087)	-0.073 (.075)	0.011 (.078)	-0.100 (.077)	-0.073 (.076)
Violence	0.081 (.137)	0.077 (.121)	-0.008 (.125)	-0.054 (.131)	-0.064 (.121)
Current crisis status	-0.549 (.477)	0.249 (.388)	-0.120 (.398)	0.260 (.406)	0.359 (.386)

Note: * $P < .01$; † $P < .05$

ational services (52.9%), therapies (32.2%), support groups (51.6%), and dental care (22.0%). A smaller percentage reported unmet needs for medical (15.7%), psychological (10.6%), social work (12.2%), transportation (14.0%), and legal services (9.0%).

Data Analysis Plan

To maximize the power of the predictive analyses, only services that were received by at least 80% or which were needed by at least 20% of the sample were examined. The following services showed adequate variability in current use to permit powerful analyses: receipt of medical services, dental services, social work, support groups, recreation, and transportation. More than 20% of the sample expressed unmet needs for dental services, support groups, recreation,

specialized training, and therapies. Using simultaneous entry procedures, all 19 predictors were used. Table 2 presents the betas and standard error of the betas for each regression equation, whereas log likelihood ratios and percent correctly classified are presented subsequently. Table 3 presents the logistic regression results for unmet service needs.

Identifying Predictors of Service Use

The use of medical services was significantly predicted by the regression equation ($\chi^2[19]=63.27, P < 0.001$), with 71.43% of respondents correctly classified. The log likelihood ratio showed that those most likely to be receiving medical services were: white (2.7 times more likely than black), older (1.05 times more likely), had a history of prior institutionalization (1.95

times more likely), had a lower per capita income (0.96 times more likely), had more physical illnesses (1.22 times more likely), had lower adaptive functioning (0.80 times more likely), and had lower levels of emotional instability (0.92 times more likely).

Most (71.83%) of the sample and 92% of those using dental services could be correctly classified ($\chi^2[19]=35.96, P<0.01$). The only significant predictor from the set was race. The log likelihood ratio showed that whites were 3.63 times more likely than blacks to receive dental services.

Receipt of social work services was predicted by the variable set ($\chi^2[19]=55.94, P<0.001$), with 76.33% of the entire sample and 93.8% of all users being correctly classified. Four significant predictors emerged: living away from the mother (likelihood ratio=0.336), prior institutionalization (likelihood ratio=3.25), lower levels of adaptive functioning (likelihood ratio=0.827), and not being in crisis (likelihood ratio=0.278).

The use of consumer support groups was not predicted by the set ($\chi^2[19]=25.60$). Although 71.53% of the sample was correctly classified, only 19% of those who were currently attending support groups were identified, with adaptive functioning (likelihood ratio=0.906) and emotional instability (likelihood ratio=0.933) emerging as significant.

The predictor set correctly classified 74.30% of the entire sample for the use of recreational services ($\chi^2[19]=42.87, P<0.001$). Significant predictors included being employed (likelihood ratio=2.254), lower levels of adaptive functioning (likelihood ratio=0.806), and fewer episodes of emotional instability (likelihood ratio=0.929). Although not emerging as a significant predictor, whites were 1.76 times more likely to be receiving recreational services.

The majority of the sample (78.32%), but only 38.46% of those actually using transportation services, could be classified by the model ($\chi^2[19]=62.37, P<0.001$). Significant predictors of transportation service use included living away from the mother (likelihood ratio=0.288), prior institutionalization (likelihood ratio=2.755), lower adaptive functioning (likelihood ratio=0.803), more violent behaviors (likelihood ratio=1.350), and not being in crisis (likelihood ratio=0.341).

Identifying Predictors of Unmet Service Need

Using the full set of 19 variables indexing enabling, predisposing, and need factors, logistic regression analyses were conducted to predict the various unmet service needs; betas and standard errors of beta are presented in Table 3.

Most (79%) of the sample could be correctly classified with regard to unmet needs for dental services ($\chi^2[19]=43.59, P<0.001$). The only significant predictors were race (likelihood ratio=0.252) and prior institutionalization (likelihood ratio=0.444), thus being black and not having been institutionalized were associated with

unmet needs for dental services.

The unmet need for consumer support groups was not significantly predicted by the logistic regression equation ($\chi^2[19]=24.50$), with only 61.96% of the sample correctly classified. The sole significant predictor was withdrawal (likelihood ratio=1.199).

The predictor set correctly classified 63.96% of those with unmet needs for recreational services ($\chi^2[19]=46.57, P<0.01$). Significant predictors included being unemployed (likelihood ratio=0.359) and having higher levels of adaptive functioning (likelihood ratio=1.100).

The unmet need for vocational training services was predicted ($\chi^2[19]=45.50, P<0.001$), with 67.25% of the sample and 77% of those with unmet need being correctly classified. Significant predictors included fewer years of education (likelihood ratio=0.841), being unemployed (likelihood ratio=0.369), and higher adaptive functioning (likelihood ratio=1.134).

The unmet need for therapeutic services was significantly predicted by the regression equation ($\chi^2[19]=37.80, P<0.01$), with 68.99% of the sample correctly classified. The only predictor to emerge as significant was confusion; those with higher levels of confusion were 1.125 times more likely to have unmet needs for therapy services. Although not emerging as significant, people currently in crisis were 1.432 times more likely to have unmet needs for therapeutic services.

DISCUSSION

This article describes and predicts service use and unmet service needs among adults with chronic mental illness. The study offers an opportunity to examine such fundamental questions as:

- Who is being served by the formal service system?
- Who needs assistance from formal services?
- Where should increased efforts for program development be directed?

The study also offers an opportunity to examine the applicability of the Andersen model of service use with a large, representative sample of adults with schizophrenia.

From a descriptive perspective, many adults with schizophrenia are receiving considerable support from the formal service network, receiving an average of four services. Most of the sample was receiving psychological, social work, dental, and medical services. Despite that the formal service system does seem to be addressing a large number of the needs of community-dwelling adults with chronic mental illness, unmet service needs remain. A large number of adults need services that they are not receiving, especially in the form of recreational, transportation, and specialized training opportunities, exactly the services that are intended to promote community integration.

Andersen's model of medical service use seems to offer heuristic value for organizing information about service use by adults with

schizophrenia, with predisposing, enabling, and need factors emerging as important predictors. Predisposing, enabling, and need factors, represented by race and prior institutionalization, employment status, and adaptive functioning, respectively, emerged as significant predictors of receipt and unmet need across several services. Thus, the model set forth by Andersen does apply to the use of community-based services by adults with CMI.

The pattern of results from this model suggests several important findings for the field of mental health service delivery. First, it is clear that blacks are consistently underserved, especially for medical and dental services. The odds ratio showed that whites are two to three times more likely to receive formal assistance. The reasons for this discrepancy must be examined and addressed. It is possible that blacks simply do not identify themselves to the formal service system. If that is the case, educational efforts in the community may allow more blacks to receive assistance.

In addition, because prior institutionalization emerges as significant across several services, it may be that those who have entered into the formal system via institutions are more likely to receive formal support when they are living in the community. Although this study does not address specific attitudes toward formal services, it is likely that by not identifying themselves to the formal service system early in the course of CMI, blacks excuse themselves from receiving current and future services. An understanding of the roles of attitudes and cultural values may be particularly important for those developing outreach efforts for the black community.

Although the betas and likelihood ratios indicate which variables were significant in each individual equation, the variables that do not emerge as significant are equally noteworthy. Specifically, age of the consumer does not emerge as a significant factor in service use (with the exception of medical service use), despite a wide age range in the sample. Indicators of socioeconomic status (ie, education and mother's income) seem to have minimal influences on service use. Further, it is striking that variables that are considered to be hallmarks of chronic mental illness (ie, disruptiveness, withdrawal, confusion, odd behaviors, and violent behaviors) seem to offer little predictive power despite that they were well distributed across the sample. This lack of influence could suggest that the formal service system is somewhat "blind" to the disturbing and maladaptive behaviors of its clients, serving all equally.

Further, the use of and need for different services were often predicted by different sets of variables. The main point seems to echo that made by Biegel et al³⁸: different services have unique predictor sets. The differentiation of predictors of service use and predictors of unmet service needs, although beyond the scope of the

model originally proposed by Andersen, offers several striking conclusions with important implications for service providers. The distinction addresses the basic question of whether those who are receiving a service are similar to those who need it but are not receiving it. Across the formal services examined, users and those with unmet needs were classified by distinctly different sets of predictors. The implications for the formal service network seems to be that although current outreach efforts are attracting a large number of those who need services, alternative methods may be necessary to fully serve all those with need. Awareness that the two groups, users and those with unmet needs, have different characteristics may help guide this outreach effort.

Although these results offer several clear findings about the current service use and the unmet service needs of community-dwelling adults with CMI, the generalizability of the study is limited by the need to cross-validate the regression equations. It is further limited by the use of caregiving mothers as reporters and the geographic region in which the study was conducted because service delivery varies widely across regions, states, and communities. In addition, although it appears that some formal services are being used by a majority of mental health consumers (ie, medical, psychological, and social work services), other researchers³⁹ have cautioned that the mere receipt of a formal service does not imply that one's need for that service is being met. This study did not examine perceptions of the quality of the services provided or one's satisfaction with service provision. Individual service agencies must constantly monitor the effectiveness of various treatment plans and of specific therapists for individual consumers.

It is also important to note that although medical, psychological, and social work service use is high, unmet service needs remain for even these most basic services. That more than 10% of the adults in the sample need medical, psychological, and social work services that they were not receiving suggests that outreach efforts need to be directed toward these persons. Research must discover whether they are not receiving services because of their own refusal to participate, as correlations with adaptive functioning, emotional instability, and noncompliance would suggest, or whether barriers to service use must be removed, such as lack of transportation.

Although limitations to this study exist, it should be remembered that unmet needs for many services were predicted with a significant regression equation. Although some of the equations identified only a fraction of those with unmet need, this fraction *was* identified. Future research can build on these findings to guide program development, improve program evaluation, increase the efficacy of outreach techniques, and identify persons who require assistance.

REFERENCES

1. Andersen RM. *A Behavioral Model of Families' Use of Health Services*. Chicago, Ill: Center for Health Administration Studies; 1968.
2. Biegel DE, Sales E, Schulz R. *Family Caregiving in Chronic Illness*. Newbury Park, Calif: Sage Publications; 1991.
3. Dearth N, Lebonski B, Mott M, Pellegrini L. *Families Helping Families: Living With Schizophrenia*. New York, NY: WW Norton; 1986.
4. Goldman HH. Mental illness and family burden: a public health perspective. *Hosp Community Psychiatry*. 1982; 33:557-560.
5. Lefley HP. Aging parents as caregivers of mentally ill adult children: an emerging social problem. *Hosp Community Psychiatry*. 1987; 38:1063-1070.
6. Mindel CH, Wright R, Starret RA. Informal and formal health and social support systems of black and white elderly: a comparative cost approach. *Gerontologist*. 1986; 26:279-285.
7. Minkoff K. A map of chronic mental patients. In: Talbott JA, ed. *The Chronic Mental Patient*. Washington, DC: American Psychiatric Association; 1978.
8. Talbott JA. The chronic mental patient: what have we learned? *American Journal of Social Psychiatry*. 1983; 3:37-42.
9. Taylor RJ. Receipt of support from family among black Americans: demographic and familial differences. *Journal of Marriage and the Family*. 1986; 48:67-77.
10. Ascher-Svanum T, Sobel TS. Caregivers of mentally ill adults: a women's agenda. *Hosp Community Psychiatry*. 1989; 40:843-845.
11. DeChillo N. Collaboration between social workers and families of patients with mental illness. *Families in Society: Journal of Contemporary Human Services*. 1993; 74:104-114.
12. Edwards DF, Danziger WL. *Congruence Between Patients and Collateral Source in Interviews for Dementia*. Paper presented at meetings of Gerontological Society of America; Boston, Mass; 1982.
13. Hatfield AB. The family as partner in the treatment of mental illness. *Hosp Community Psychiatry*. 1979; 30:338-340.
14. Simon EP, Showers N, Blumenfeld S, Holden G, Wu X. Delivery of home care services after discharge: what really happens? *Health Soc Work*. 1995; 20:5-14.
15. Smets AC. Family and staff attitudes toward family involvement in the treatment of hospitalized chronic patients. *Hosp Community Psychiatry*. 1982; 33:573-575.
16. Callahan D. Setting mental health priorities: problems and possibilities. *Milbank Q*. 1994; 72:451-470.
17. Dorwart RA. A ten-year follow-up study of the effects of deinstitutionalization. *Hosp Community Psychiatry*. 1988; 39:287-291.
18. Goering PN, Wasylenki DA, Farkas M, Lancee WJ, Ballantyne R. What difference does case management make? *Hosp Community Psychiatry*. 1988; 39:272-276.
19. Lehman AF. Strategies for improving services for the chronically mentally ill. *Hosp Community Psychiatry*. 1989; 40:916-920.
20. Williams P, Williams WA, Sommer R, Sommer B. A survey of the California Alliance for the Mentally Ill. *Hosp Community Psychiatry*. 1986; 37:253-256.
21. Biegel D, Milligan S, Putnam P, Song L. Predictors of burden among lower socioeconomic status caregivers of persons with chronic mental illness. *Community Ment Health J*. 1994; 30:473-494.
22. Ninde NK. *Yes I Can! Seven True Stories of Persons Coping With Mental and Emotional Illness*. Franklin County, Oh: Alliance for the Mentally Ill (AMI); 1990.
23. Ory MG, Williams TF, Emr M, et al. Families, informal supports, and Alzheimer's disease. *Research on Aging*. 1985; 7:623-644.
24. Stone R, Cafferata GL, Sangl J. Caregivers of the frail elderly: a national profile. *Gerontologist*. 1987; 27:616-626.
25. Torrey EF. *Surviving Schizophrenia: A Family Manual*. Rev ed. New York, NY: Harper and Row; 1988.
26. Pardes H. Problems in providing future services to the mentally ill. In: Fransen VE, ed. *Mental Health Services in the United States and England: Struggling for Change*. Princeton, NJ: Robert Wood Johnson Foundation; 1990.
27. Stein LI. Filling the gaps: service gaps and exemplary programs in the treatment of chronic mentally ill persons. In: Fransen VE, ed. *Mental Health Services in the United States and England: Struggling for Change*. Princeton, NJ: Robert Wood Johnson Foundation; 1990.
28. Kreisman DE, Joy VD. The family as reactor to the mental illness of a relative. In: Guttentag M, Struening EL, eds. *Handbook of Evaluation Research*. Vol 2. Beverly Hills, Calif: Sage Publications; 1975.
29. McElroy EM. The beat of a different drummer. In: Hatfield AB, Lefley HP, eds. *Families of the Mentally Ill: Coping and Adaptation*. New York, NY: Guilford Press; 1987:225-243.
30. Andersen RM, Newman JF. Societal and individual determinants of medical care utilization in the United States. *Milbank Q*. 1973; 51:95-124.
31. Andersen RM, Aday L. Access to medical care in the US: realized and potential. *Med Care*. 1978; 16:533-546.
32. Wolinsky FD. Health services utilization among older adults: conceptual, measurement, and modeling issues in secondary analyses. *Gerontologist*. 1994; 34:470-475.
33. Bass DM, Noelker LS. The influence of family caregivers on elder's use of in-home services: an expanded conceptual framework. *J Health Soc Behav*. 1987; 28:184-196.
34. McAuley W, Arling G. Use of in-home care by very old people. *J Health Soc Behav*. 1984; 25:52-64.
35. Miller B, Montgomery A. Family caregivers and limitations in social activities. *Research on Aging*. 1990; 12:72-93.
36. Noelker LS, Bass DM. Home care for elderly persons: linkages between formal and informal caregivers. *J Gerontol*. 1989; 44:S63-S70.
37. Noelker LS, Bass DM. Relationships between the frail elderly's informal and formal helpers. In: Kahana E, Biegel DE, Wykle ML, eds. *Family Caregiving Across the Lifespan*. Thousand Oaks, Calif: Sage Publications; 1994.
38. Biegel DE, Bass DM, Schulz R, Morycz R. Predictors of in-home and out-of-home service use by family caregivers of Alzheimer's disease patients. *Journal of Aging and Health*. 1993; 5:419-438.
39. Grosser RC, Vine P. Families as advocates for the mentally ill: a survey of characteristics and service needs. *Am J Orthopsychiatry*. 1991; 61:282-290.
40. National Center for Health Statistics. *Long-term Care Survey: Interview Schedule*. Rockville, Md: NCHS Form LTC-3; 1982.
41. Lawton MP, Moss M, Fulcomer M, Kleban MH. A research and service-oriented multilevel assessment instrument. *J Gerontol*. 1982; 37:91-99.
42. Nihira K, Foster R, Shelhaas M, Leland H. *Adaptive Behavior Scale*. Washington, DC: American Association on Mental Deficiency; 1975.
43. Katz MM, Lyerly SB. Methods for measuring adjustment and social behavior in the community, I: rationale, description, discriminative validity and scale development. *Psychol Rep*. 1963; 13:503-535.
44. Nihira K, Leland H, Lambert N. *Manual: Adaptive Behavior Scale—Residential and Community*. Austin, Tex: Pro-Ed; 1993.