

Physical and Behavioral Health of Adults with Mental Retardation Across Residential Settings

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SYNOPSIS

Objectives. This article presents survey data about the health and behavioral characteristics of a randomly selected sample of 629 adults with mental retardation (MR) living in Massachusetts in 2000. The goals of this analysis were to: describe the health, behavioral, and functional characteristics of the sample; examine relationships between consumer health, behavior problems, and functioning; and analyze variations in health and behavior problems by type of residential setting (parent/relative home, community residence, or institutional setting).

Methods. The authors analyzed data obtained from interviews with proxies (relatives, guardians, advocates, or program staff) on behalf of consumers and from state agency records. Chi-square analyses were conducted to examine the relationships between health, behavioral, and functional characteristics of consumers and differences in health and behaviors by type of residence.

Results. More than 80% of consumers were reported to have either "excellent" or "good" health. Overall health status did not significantly vary by residential type, but was significantly related to the presence of additional disabilities and some functional limitations. Several health and behavioral measures varied significantly by residential type: recent physical, dental, and ob/gyn exams; medication usage; problem behaviors; and functional level.

Conclusions. As large numbers of individuals with MR reach adulthood and old age, public health and medical professionals face the challenges of addressing the health and behavioral needs of this population, preventing secondary health conditions, and improving environmental conditions that may influence health and mental health.

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The availability of and access to health care for individuals with mental retardation (MR) and other disabilities has received increased public attention in the past several years.¹⁻³ *Healthy People 2010*, a comprehensive set of disease prevention and health promotion objectives for the nation, identifies “disability and secondary conditions” as a key focus area.¹ *Healthy People 2010* sets forth goals to “promote the health of people with disabilities, prevent secondary conditions, and eliminate disparities between people with and without disabilities in the U.S. population.”¹ A recent report by the office of the U.S. Surgeon General identifies the unmet health needs among people with MR, describes disparities in health and health care affecting people with MR, and presents a national blueprint to improve the health of this population.³

Increased life expectancy of people with disabilities and improved medical and assistive technologies have helped many individuals with MR, even with severe disabilities, to reach adulthood and old age. Most of these individuals live in community-based settings and utilize community-based services and supports, including primary health care. The health needs of people with MR are similar to those of many people with disabling conditions: “physical activity, nutrition, access to health care, clinical preventive services, oral health, mental health, and family caregiving.”⁴ However, people with MR experience poorer health and have less access to health care than the general population.³

There is a shortage of qualified trained health care professionals with in-depth knowledge about the specialized health and mental health needs of people with MR. Common problems are “lack of appropriate, specific training, inadequate reimbursement policies, fear, and prejudice.”² The current system of managed care is “particularly detrimental for individuals with MR” because of their needs for coordinated care and case management by providers experienced with this population.⁵ People with MR often face cognitive challenges in understanding or recognizing their own health problems, communicating their needs to health providers, and understanding and adhering to health and behavioral treatments. Moreover, cultural and language barriers may further complicate their communications and interactions with health care professionals.

People with MR are at high risk for multiple health and behavioral problems including “obesity, cardiovascular disease, osteoporosis, seizures, mental illness and behavior disorders, hearing and vision problems, and poor conditioning and fitness.”⁴ Emotional and behavioral disorders and mental illness are “among the most common and least understood aspects of health and MR.”³ People with MR and their families are frequently exposed to environmental stressors (social, economic, and physical) that may negatively influence their health and mental health or limit their access to health and mental health treatment.² For example, poverty, poor housing, unemployment, and lack of transportation may jeopardize their health and their access to appropriate care.

Research on the health and behavioral characteristics and needs of people with MR has been limited in several respects. Most studies have been based on small institutional samples and on administrative records of public agencies.² There is a lack of empirical data based upon large probabil-

ity samples of adults with MR. Although most adults with MR live in community settings,⁵ only a few studies have compared the health status and needs of individuals living in various types of community living arrangements such as group homes, parent/relative homes, foster homes, or independent living settings.⁶⁻⁸

It is important to understand how health and behavior vary by type of residential setting so that appropriate interventions can be targeted to address the specific needs of individuals living in different types of settings. Rimmer et al. found significant differences in the health characteristics and behaviors of adults with MR residing in three living arrangements—institutions, group homes, and natural families.⁶ Interestingly, people living in institutions had the most favorable health risk profile in terms of Body Mass Index, body fat level, and lipoprotein profile. Residents of group homes reportedly smoked more cigarettes and drank more alcohol and coffee (although overall use was quite limited), and exercised less than those living in institutional and family environments.⁶ These researchers suggest that less restrictive settings such as group homes or family settings may provide less supervision and monitoring of diets and more opportunities for adults to make their own decisions about food and exercise. Similarly, Lewis et al. compared the quality of health care for adults with developmental disabilities living in three different types of community settings (community care facilities, own homes, or homes of family members or friends).⁸ They found that preventive health services (e.g., flu vaccine, TB test, and Pap smear) were notably lacking, particularly for individuals living alone or with family or friends. These findings imply the need for health promotion, prevention, and awareness initiatives for individuals living in various types of settings.

Emotional and behavioral conditions among people with MR have not received adequate research attention. People with MR have been reported to be at higher risk for behavioral and emotional difficulties than the general population, with prevalences ranging from 20% to 40%.⁴ While some studies have examined the prevalence of mental disorders, behavior problems, and/or use of psychotropic medications among people with MR, much of the available data are based upon reviews of administrative case records and upon samples of institutionalized residents. The presence of MR frequently overshadows the symptoms of mental disorders; i.e., clinicians and researchers often attribute the symptoms indicative of a mental disorder to the MR rather than to a separate diagnostic condition.⁹

This article presents recent survey data on the health and behavioral characteristics of a randomly selected sample of adults with MR living in Massachusetts in a variety of residential settings—community residences, parent/relative homes, institutional facilities, and nursing homes. The goals of this analysis are to: (1) describe the health, behavioral, and functional characteristics of this sample of adults; (2) examine relationships between consumer health, behavior problems, and functioning; and (3) analyze variations in health and behavior problems by type of residential setting. The implications of these findings for public health and medical professionals who work with adults with MR, their families, and the health care system are discussed.

METHODS

Sampling

This study is based on a random sample of adults with MR drawn from the Massachusetts Department of Mental Retardation (DMR) Consumer Registry System (CRS) in September 2000. These adult consumers met the following criteria: 18 years of age or older; receiving DMR services for at least one year; receiving service coordination plus at least one other service/support (not including consumers receiving only service coordination and transportation); and were not included in a Consumer Survey sample drawn one year earlier.

To ensure broad representation of consumers across DMR regions and across various types of residential settings, the sampling strategy involved selection of two subsamples drawn from the CRS. First, a random sample was drawn of 1,000 DMR consumers living independently, or in parent or relative homes, community residences, or nursing homes. This sample was stratified by geographic region. To ensure adequate representation for statistical analysis, a second random sample was drawn of 200 consumers living in DMR institutional facilities.

After the elimination of duplicate names and ineligible consumers (e.g., those with no available mailing address), there were 989 consumers in the first subsample and 203 in the second subsample, resulting in an overall sample pool of 1,192 consumers. Introduction letters to the 1,192 consumers and their legal guardians were mailed by DMR, with follow-up telephone recruitment calls by interview staff from Boston University School of Social Work. A final sample of 693 consumers and/or their proxies (guardians, family members, or staff) completed Consumer Survey interviews. This represents 58% of the contacted individuals. The response rate varied somewhat by the type of residence in which consumers lived. Consumers living in community residences had the highest rate of participation in the survey (65.7% of consumers in community residences). Almost 60% of consumers living in parent or relative homes (58.6%) and about half of residents living in institutional facilities (50.2%) participated in this study.

For the analysis reported in this manuscript, the respondent sample consisted of 629 consumers; 64 of the 693 cases were excluded due to missing data on key analysis variables. This respondent sample included slightly more males than females (51.8% male, 48.2% female). The average age of consumers was 44 years, with a range from 18 to 89 years. Ninety-three percent of the consumers in the sample were identified as "Caucasian." Consumers lived in a variety of residential settings: with parent or relative ($n=249$, or 39.6%); community residence ($n=262$, or 41.7%); institutional facility ($n=103$, or 16.4%); nursing home ($n=15$, or 2.4%).

Data collection and measures

Data were obtained from two sources: the DMR Consumer Survey interviews and the CRS database.

The DMR Consumer Survey instrument is based upon the national Core Indicators Project Consumer Survey, developed by the Human Services Research Institute and the National Association of State Developmental Disabilities Directors.¹⁰ This instrument, tested for reliability and validity

by the Core Indicators Project, assesses key outcomes of adults with MR in terms of various domains: community inclusion; choice and decision-making; rights and respect; service coordination and access; safety; satisfaction; relationships; and health. The present article focuses primarily on Consumer Survey data about consumers' health, behavioral problems, and functional level.

Some sections of the Consumer Survey instrument were designed to obtain subjective consumer satisfaction information directly from consumer respondents. Other sections of the Consumer Survey, including specific health and behavioral information, were designed to be answered by proxy informants who had close personal or professional relationships with consumers. The specific health and behavioral questions included in the analyses reported here were not asked directly of consumers, due to concerns about the sensitivity and complexity of this specific information. The proxy respondents for the health questions were family members, guardians, advocates, residential or day program staff, or case managers.

While there are concerns in the literature about the reliability and validity of proxy-reported data on behalf of consumers with cognitive limitations, these issues have been addressed in this specific analysis in the following ways:

1. The health and behavioral data obtained from proxies are primarily fact-oriented, e.g., types of medications used, recent medical exams, evidence of specific behavioral problems. Recent research indicates that proxies may be considered reliable sources of objective data about adults with MR, but not as appropriate in providing subjective data related to consumer satisfaction or quality of life.¹¹
2. The health and behavioral data were obtained from proxies for all consumer respondents in this study. This avoided potential discrepancies between proxy data collected for some respondents and consumer self-report data for others.
3. Many of the health and behavioral questions in this study were either too complex or potentially inappropriate or insensitive to ask directly of consumers with significant cognitive limitations.

Proxies were asked to rate the overall health of the consumer during the past year on a four-point rating scale (excellent/good/fair/poor). This measure was collapsed into a dichotomous variable (excellent/good vs. fair/poor) for this analysis. Data were also obtained from proxies about the frequency of care required by a nurse or physician; recent physical, dental, and ob/gyn exams; and use of medications for mood, anxiety, or behavior problems. In addition to these health-related questions, three specific types of problem behaviors (self-injury, disruptive behavior, and uncooperative behavior) were assessed using a modified version of the Inventory for Client and Agency Planning (ICAP).¹²

The Consumer Survey also included information about whether individuals had disabilities in addition to MR (mental illness/psychiatric diagnosis, autism, cerebral palsy, brain injury/neurological problem, chemical dependency, or other unspecified disability). A dichotomous variable for having any additional disability was created based on "yes" responses to any of these disabilities. Similarly, dichotomous variables

were created for receiving any medication (mood, anxiety, and/or behavior medication) and for exhibiting any problem behavior (self-injury, disruptive behavior, and/or uncooperative behavior). In addition, a sum was computed of the number of types of medications used (mood, anxiety, and/or behavior) ranging from no medications to all three types of medication. Similarly, a sum was computed of the number of types of behavior problems exhibited (self-injury, disruptive, and/or uncooperative), ranging from no behavior problems to all three types of behavior problems.

The second source of data used in this analysis, the CRS, provided basic demographic and background information about age, race, gender, level of MR, and type of residence. Information was also obtained from the CRS about the consumer's vision (normal with or without correction vs. impaired), hearing (normal with or without correction vs. impaired), and mobility (walked independently, walked with some kind of assistance, used wheelchair with or without assistance, or bedridden).

CRS data on level of MR were collapsed for this analysis into three levels: above mild/mild, moderate, and severe/profound. The CRS also included information about the type of residence in which the consumer lived based upon the following coding categories: parent/relative home; community residence (group home, foster home, staffed apartment, or other community residential program); institutional facility (state facility or hospital); or nursing home. Individuals coded as living independently were omitted from this analysis because they were few in number.

Analysis

We conducted chi-square analyses to examine the relationships between overall health of consumers (excellent/good vs. fair/poor) and other health, behavioral, and functional characteristics. Chi-square analyses were also used to analyze variations in consumer health, behavior problems, and functional characteristics by type of residence (parent/relative home, community residence, or institutional facility). Because of the small number of consumers living in nursing homes ($n=5$), these cases were omitted from the chi-square analyses of variations by type of residence. The ns for the chi-square analyses varied depending upon the number of valid responses to the specific survey items. An alpha level of $p=0.05$ was used as the standard for statistical significance.

RESULTS

Description of health, behavioral, and functional characteristics

A description of the health, behavioral, and functional characteristics of the 629 respondents is presented in Table 1. The percentages shown in Table 1 and reported here were calculated using the number of individuals for whom valid answers were provided as denominators. These ns ranged from 589 to 629.

Health. More than 80% of consumers were reported to have either "excellent" or "good" health. About one in ten consumers required daily or 24-hour access to medical care by a nurse or physician. Nearly all consumers (94.9%) were reported to have had a physical exam within the past year, and

78.6% were reported to have had a dental visit within the last six months. More than 60% of women consumers had an ob/gyn exam within the last year, while 16% had never had an ob/gyn exam.

More than a third of all consumers (38.0%) were currently taking medications for mood disorders, anxiety, and/or behavioral problems. As shown in Table 1, medications were taken most frequently for mood disorders (30.6%). About one-quarter of respondents took medications for behavior problems (25.0%), and a similar percentage took medication for anxiety (23.1%). Of those consumers who took medications, 60.7% were receiving more than one of these types of medications and slightly more than one-third (34.3%) were receiving all three types of medications.

Behavior problems. Almost half (45.9%) of all consumers were reported to have at least one of three types of problematic behavior: self-injurious, disruptive, or uncooperative behavior. Of those consumers who were reported to have behavior problems, 18.8% exhibited all three types of problematic behaviors. As shown in Table 1, almost one-quarter of all consumers in the sample had self-injurious behaviors, about 30% had disruptive behaviors, and uncooperative behaviors were reported for about 28% of the sample. Problematic behavior occurred at least weekly in 39.5% of those with self-injurious behavior, 41.2% of those with disruptive behavior, and 45.8% of those with uncooperative behavior.

Functional characteristics. About two-thirds of consumers were classified as having above mild/mild or moderate levels of MR, and about one-third as having severe/profound retardation. Almost two-thirds of respondents (63.4%) had another disability in addition to MR. The additional disabilities most frequently reported were brain injury or neurological problem (16.5% of consumers), mental illness or psychiatric diagnosis (15.4%), cerebral palsy (12.2%), or other unspecified disability (33.4%). Fifteen percent of respondents were reported to have vision impairments, and 9.1% were reported to have hearing impairments. About 15% of the sample was non-ambulatory (used a wheelchair either with or without assistance or were bedridden).

Relationships between health, behavioral, and functional status

To investigate relationships between consumer health, behavior, and functioning, we compared consumers with excellent/good overall health to those with fair/poor overall health in terms of various health, behavioral, and functional measures. See Table 1 for the results of these cross-tabulation analyses.

Health. Individuals in fair or poor health were more likely than those who were in excellent or good health to require daily or 24-hour access to medical care by a nurse or physician (22.0% vs. 8.8%). While almost all consumers had a physical exam within the past year, those in fair or poor health were significantly more likely to have had a recent exam (99.1% of consumers in fair/poor health vs. 94.0% in excellent/good health). No relationships were found between overall health status and recent dental exams or recent ob/gyn exams. Overall health status was not related to the likelihood of taking medications for mood disorders, anxiety disorders, or behavior problems.

Table 1. Health, behavior problems, and functional level: full sample and differences between overall health subgroups

Variable	Overall health					
	Full sample		Excellent/good		Fair/poor	
	Number	Percent	Number	Percent	Number	Percent
Health:						
Overall health						
Excellent	187	29.7	—	—	—	—
Good	329	52.3	—	—	—	—
Fair	95	15.1	—	—	—	—
Poor	18	2.9	—	—	—	—
Requires daily or 24-hour access to medical care ^a	68	11.2	44	8.8	24	22.0
Physical exam w/in past year ^b	580	94.9	471	94.0	109	99.1
Dental exam w/in past six months	469	78.6	387	78.8	82	77.4
Ob/gyn exam						
Within past year	171	63.8	135	61.9	36	72.0
Over a year ago	54	20.1	45	20.6	9	18.0
Never had an exam	43	16.0	38	17.4	5	10.0
Takes medication for mood disorder	183	30.6	144	29.2	39	36.8
Takes medication for anxiety	136	23.1	104	21.5	32	30.2
Takes medication for behavior problem	147	25.0	118	24.5	29	27.1
Behavior problems:						
Self-injurious behavior	141	22.9	112	22.2	29	26.1
Disruptive behavior	186	30.2	155	30.8	31	27.7
Uncooperative behavior	170	27.7	142	28.3	28	25.0
Functional level:						
Level of mental retardation						
Above mild/mild	207	34.7	165	33.7	42	39.3
Moderate	183	30.7	154	31.5	29	27.1
Severe/profound	206	34.6	170	34.8	36	33.6
Any additional disability ^b	399	63.4	317	61.4	82	72.6
Vision impairment	91	15.0	78	15.6	13	12.0
Hearing impairment ^c	55	9.1	38	7.6	17	16.0
Non-ambulatory ^c	91	14.6	66	12.9	25	22.3

NOTE: N=629; for excellent/good health, n=516; for fair/poor health, n=113. For specific variables and health subgroups, ns ranged from 589 to 629, depending on the number of valid responses to the specific survey items.

^aDifference between overall health subgroups significant at $p < 0.001$.

^bDifference between overall health subgroups significant at $p < 0.05$.

^cDifference between overall health subgroups significant at $p < 0.01$.

Behavior problems. There were no significant relationships between overall health status and the presence of specific problematic behaviors (self-injury, disruptive behavior, or uncooperative behavior).

Functioning. Overall health was significantly associated with some aspects of functioning. Consumers reported to be in fair or poor health were more likely to have an additional disability than those reported to be in excellent or good health. Those in fair/poor health were more likely to have

hearing impairments than those in excellent/good health (16.0% vs. 7.6%) and more likely to be non-ambulatory (22.3% vs. 12.9%). On the other hand, health status did not vary significantly by level of retardation; the proportion of consumers in excellent or good health was consistent across retardation levels.

In summary, overall health status was significantly related to the presence of additional disabilities and some functional limitations. However, there were no significant associations between health status and level of retardation, be-

tween health status and the presence of behavioral problems, or between health status and medication usage.

Variations in health and behavioral problems by type of residence

Across most of this study's measures of health, behavior, and functioning, there were significant variations by residential setting (Table 2). The 15 consumers residing in nursing homes were excluded from this analysis due to the small cell size for this residential subgroup.

Health. Overall health status did not significantly vary across the three types of residential settings analyzed. More than 80% of consumers living in parent or relative homes (83.1%) or community residences (84.7%) were in excellent or good

health. Even in institutional facilities, more than three-quarters of residents (77.7%) were reported to be in excellent or good health. While nearly all consumers were reported as having had recent physical exams, consumers living in parent or relative homes were the least likely to have had a physical exam within the past year. About 10% of that group had not had a recent exam. Dental visits also varied by residential setting. Individuals living with parents or relatives were the least likely to have had a dental visit within the last six months (72.4%). Female consumers living in community residences or institutional facilities had higher reported rates of receiving an ob/gyn exam within the past year than those living in parent or relative homes. Female consumers living in parent or relative homes were most likely to have never had an ob/gyn exam (27.2%).

Table 2. Differences in health, behavior problems, and functional level by type of residence

Variable	Parent/relative home		Community residence		Institutional facility	
	Number	Percent	Number	Percent	Number	Percent
Health						
Overall health						
Excellent/good	207	83.1	220	84.7	80	77.7
Fair/poor	42	16.9	40	15.3	23	22.3
Requires daily or 24-hour access to medical care ^a	3	1.2	14	5.6	44	46.3
Physical exam w/in past year ^a	225	90.7	243	96.8	97	100.0
Dental exam w/in past 6 months ^b	176	72.4	206	82.1	80	87.9
Ob/gyn exam ^a						
Within past year	71	56.8	68	71.6	28	73.7
Over a year ago	20	16.0	19	20.0	9	23.7
Never had an exam	34	27.2	8	8.4	1	2.6
Takes medication for mood disorder ^a	46	19.0	101	40.4	33	35.9
Takes medication for anxiety ^a	34	14.0	77	31.3	24	27.6
Takes medication for behavior problem ^a	29	11.8	88	36.1	26	30.2
Behavior problems:						
Self-injurious behavior ^a	27	11.3	81	31.2	30	29.7
Disruptive behavior ^a	43	17.8	101	38.8	37	37.4
Uncooperative behavior ^a	46	19.1	91	35.0	30	30.6
Functional level:						
Level of mental retardation ^a						
Above mild/mild	119	53.1	74	29.0	8	7.8
Moderate	79	35.3	86	33.7	11	10.8
Severe/profound	26	11.6	95	37.3	83	81.4
Any additional disability ^a	134	53.8	173	66.0	81	78.6
Vision impairment ^a	20	8.4	37	14.5	33	32.4
Hearing impairment ^a	11	4.6	25	9.8	19	19.4
Non-ambulatory ^a	16	6.5	29	11.1	39	37.9

NOTE: For parent/relative home, $n=249$; for community residence, $n=262$; for institutional facility, $n=103$. For specific variables and residence types, n s ranged from 575 to 614, depending upon the number of valid responses to the specific survey items.

^aDifference by type of residence significant at $p<0.001$.

^bDifference by type of residence significant at $p<0.01$.

Medication usage also varied significantly by type of residential setting. Individuals in community residences had the highest rates of medication usage for mood disorders (40.4%), anxiety (31.3%), and behavior problems (36.1%). Consumers living with parents or relatives were least likely to take medications for mood disorders (19.0%), anxiety (14.0%), or behavior problems (11.8%).

Behavior problems. The presence of behavior problems also varied significantly depending upon where consumers lived. Individuals living in community residences and in institutional facilities were reported to have higher rates of problematic behaviors than those living with parents or relatives. Close to 40% of consumers living in both community residences and institutional facilities were reported to have disruptive behaviors, and about 30% to 35% in those settings were reported to have self-injurious or uncooperative behaviors. Individuals living at home with parents or relatives were least likely to have problematic behaviors (11.3% engaged in self-injury, 17.8% in disruptive behavior, and 19.1% in uncooperative behavior).

Functional characteristics. The functional impairments of consumers also differed significantly depending upon where individuals lived. Individuals living in institutional facilities were most likely to have severe/profound retardation, additional disabilities, and vision, hearing, and mobility impairments. Individuals living at home with parents or relatives were the least likely to have each of these functional limitations.

DISCUSSION

This study presents a generally positive picture of the overall health of consumers with MR living in a variety of settings. Most consumers in this survey were reported to be in excellent or good health, particularly those living with parents or relatives or in community residences. Even in institutional facilities, more than three-quarters of the respondents were reported to be in excellent or good health. A small proportion of consumers (11.2%) had health conditions that required daily or 24-hour access to medical care by a nurse or physician. These findings are fairly consistent with the results of earlier health survey research in Massachusetts. Minihan and Dean found that while about two-thirds of adults with MR living in community settings in Massachusetts had chronic medical conditions requiring medical attention, most conditions could be managed by primary care physicians with limited specialty involvement.¹³ Only 15% of individuals with MR were reported to be high utilizers of primary and specialty care. Crocker expressed optimism about these health findings, concluding, "For the majority of adults with mental retardation in the community, a general adequacy of health care can be achieved."

In terms of behavioral health, our study found that many consumers exhibited problematic behaviors: self-injury, uncooperative behavior, and/or disruptive behavior. Problematic behaviors were found to be most common among individuals living in community residences and institutional facilities, but were also evident among consumers living with parents or relatives. The prevalence and co-occurrence of problem behaviors is consistent with the research findings of Emerson et al., who conducted a population study in two

areas of England to assess the prevalence of "challenging" behaviors among people with MR.¹⁵ They found that the common forms of challenging behavior reported were aggression, destructive behavior, self-injury, and "other" behavior. The majority of people with challenging behaviors identified in this British survey exhibited two or more of these forms of challenging behavior.

One-fourth of the consumers in the present study received medication for behavior problems, with the highest usage among individuals living in community residences (36.1%). These medication usage rates are fairly consistent with the findings of other surveys. Lewis et al. found that 31% of adults with developmental disabilities living in community settings were prescribed psychotropic drugs for behavioral conditions.⁸ Anderson and Polister reviewed existing research on the prevalence of psychotropic medication use among people with developmental disabilities and found that estimated prevalence rates varied from approximately 30% to 50% among residents of state institutions and 26% to 36% among community residents.¹⁶

The present study found differences in consumers' health, problematic behaviors, and functioning depending upon whether the consumer lived at home with a parent or relative, in a community residence, or in an institutional facility. This is consistent with Rimmer et al.'s finding that living arrangements are significantly associated with health characteristics and behaviors of adults with MR.⁶

Our study findings point to some interesting (but not conclusive) residential patterns. For example, consumers living at home with parents or relatives had the lowest rates of problematic behaviors and lowest utilization of medications for behavior problems and mood disorders. However, consumers living with parents or relatives were least likely to have had recent physical exams, and female consumers in parent/relative homes were most likely to have never had an ob/gyn exam. Lewis et al. found that preventive services, including Pap smears, were notably lacking for individuals with developmental disabilities, especially for individuals living at home.⁸ The present study also showed that consumers living in community residences and in institutional facilities were most likely to have had recent ob/gyn exams and recent dental visits. They also had the highest reported rates of problematic behaviors and of medication usage for mood, anxiety, and behavior problems.

While our survey data show strong relationships between some health and behavioral variables and type of residential setting, it is important to stress that these data are correlational, not causal. We cannot infer from our findings whether consumer health or behavioral functioning helped determine the type of setting in which the consumer lived or whether the type of setting in which the consumer lived influenced the person's health or behaviors. It is also important to acknowledge that other background variables (such as level of MR or additional disabilities) may also influence the relationships between consumer health, behaviors, and type of residence. More research is needed to investigate these relationships.

Although the findings of this study are not definitive (given the study limitations discussed above), they do suggest several implications for public health and medical professionals. First, increased attention should be paid to

women's health care, since many female consumers had not had recent ob/gyn exams or had never received ob/gyn exams.

Second, the behavioral health of adults with MR is an important public health concern. Many consumers in this study exhibited self-injurious behaviors, disruptive behaviors, or uncooperative behaviors. The prevalence of these challenging behaviors is of particular concern given the obstacles and difficulties these behaviors often pose for consumers, family members, and staff. Finally, the use of medications for mood disorders, anxiety, and behavior problems was fairly common in our sample. It is important for public health professionals to examine closely the reasons for medication usage in this population and to monitor the appropriateness and effectiveness of pharmacological interventions across the different residential settings.

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