Body Weight Status Among Adults With Intellectual Disability in the Community

Kiyoshi Yamaki

Abstract

The prevalence of obese, overweight, and healthy weight adults with intellectual disability in the community was estimated using data from the National Health Interview Survey from 1985 to 2000. Using the Body Mass Index (BMI) as a measure, the percentage of adults with intellectual disability in the obese category was higher than that for the general population and increased over the 16-year period. There was no similar detectable trend for adults with intellectual disability who were in the overweight category. Compared to their counterparts in the general population, a smaller proportion of women and young adults with intellectual disability maintained their weights in the healthy range. Implications regarding potential health risks and future research were discussed.

The U.S. Surgeon General has described the substantial increase of persons with excess body weight in the United States as a critical national health agenda that requires immediate attention (U.S. Department of Health and Human Services, 2001). The prevalence of obesity in the general American population increased from 13% in the early 1960s to 30% in the 1999 to 2000 period. An overall percentage of American adults with excess body weight, which includes individuals who are either obese or overweight, has reached 64% of the population (Flegal, Carroll, Ogden, & Johnson, 2002).

Little information is available on the body weight status of adults with intellectual disability who live outside of formal services. Researchers have reported that the percentage of individuals with an excessive body weight among adults with intellectual disability is comparable to that of the general population, if not higher (e.g., Flegal & Rotatori, 1982; Janicki et al., 2002; Kelly, Rimmer, & Ness, 1986; Rimmer, Braddock, & Fujiura, 1993). These studies were, however, based on convenience samples of people, with researchers using local formal services. The results have limited generalizability for individuals with intellectual disability in the community, many of whom are supported by family members and might not have access to formal services (Fujiura, 1998; Olney & Kennedy, 2001; Yamaki & Fujiura, 2002). Researchers have argued that adults with intellectual disability who live in a less restrictive environment are at a higher risk of gaining excess body weight (Rimmer, Braddock, & Fujiura, 1993). If so, the lack of the body weight status information of adults who live outside of formal services may be a fundamental flaw in our understanding of the health status among persons with intellectual disability.

My aim in the present study was to address this information gap by estimating the body weight status in the population of adults with intellectual disability nationally. Population-level data, which are more likely to include individuals who do not access formal services, can help identify the extent and significance of the health concerns so that service priorities can be established. The results were compared to the adult population in the United States across gender and age to examine whether there was any detectable gap between the two groups.

Method

Data

Data were extracted from the 1985 to 2000 National Health Interview Survey—hereafter called

the Health Survey—public data files. Conducted annually by the National Center for Health Statistics (NCHS), this survey is a cross-sectional household sample survey on the health status of the noninstitutionalized population of the United States (National Center for Health Statistics, 2000). The information gathered through the Health Survey included general health status, acute and chronic conditions, impairment and functional limitations, and use of medical services. Data were collected through a personal interview at each sampled household. All adults who were present at the time of interview were invited to respond for themselves. Information about adults who were not present or incapable of responding by themselves due to physical and cognitive limitations was provided by other adult household members. The survey questionnaire and sampling procedure of the Health Survey were redesigned in 1997 to improve the data quality (National Center for Health Statistics, 2000).

Participants

Survey respondents were asked whether they had limitations in performing their life activities. If any limitations were mentioned, respondents were asked to name the specific health condition causing the limitation. Survey respondents, who were between 18 and 65 years of age, who indicated mental retardation as a cause of their activity limitation were labeled as adults with intellectual disability. Since the 1997 survey, respondents were also asked the duration of the health condition being present. On the basis of this information, respondents who indicated the presence of mental retardation and its onset on or before age 18 were labeled as adults with intellectual disability for the 1997–2000 surveys. Adult respondents who did not indicate mental retardation or those who indicated onset of the condition on or after age 19 were tallied as adults without intellectual disability and served as representatives of the Unites States adult population.

Body Weight Status

I used Body Mass Index (BMI), a widely used weight-for-height index (Kuczmarski & Flegal, 2000), as an indicator of the respondents' body weight status. For the pre-1997 surveys, I tabulated the BMI score of each survey respondent using the formula suggested by the National Center for Chronic Disease Prevention and Health Promotion (2002). For the 1997–2000 surveys, the BMI score had already been tabulated by the NCHS and was included in the public data files. Using the cutoff point presented by the U.S. Departments of Agriculture and Health and Human Services (2000), I classified respondents into the following three body weight categories: obese ($30 \leq$ BMI), overweight ($25 \leq$ BMI < 30), and healthy weight ($18.5 \leq$ BMI < 25).

Procedure

Data from four single-year surveys were combined to make reliable estimates for adults with intellectual disability. Thus, the participants' body weight status between 1985 and 2000 was determined by estimates from four separate time periods: (a) 1985–1988, (b) 1989–1992, (c) 1993–1996, and (d) 1997–2000. In each time period, I computed the percentile distribution of BMI scores across the three body weight categories for adults with and without intellectual disability using a statistical weight to generate a national-level estimate. The statistical weight was based on the probability of each respondent being selected in the survey on the basis of gender, age, race, and ethnic origin and was adjusted for nonresponse. In the present study, the weight was further adjusted to represent the midpoint estimate for each 4-year period. An estimate for the 1985–1988 period, for example, represented the national-level estimate at the midpoint between 1985 and 1988. I used SUDAAN (Shah, Barnwell, & Bieler, 1997) software designed for analyzing a stratified, multistage sample design survey, such as the Health Survey, in order to compute statistically weighted estimates and corresponding standard errors. The estimated proportions of obese, overweight, and healthy weight individuals were compared between adults with and those without intellectual disability across four time periods, gender, and age. A statistical difference between estimates was tested using 95% confidence intervals. No overlap of the confidence intervals was considered to be a significant difference.

Results

Table 1 summarizes the sample size of the two groups with and without intellectual disability across gender and age between 1985 and 2000. Unweighted sample size, statistically weighted sample size, and corresponding standard error are presented for each group. For the analyses by age, respondents were grouped into two age cohorts: ages 18 to 39 and ages 40 to 65.

Table 1 Number of Adults With and Without Intellectual Disability (ID) by Gender and Age, 1985–2000

	With ID			Without ID		
Characteristic	Unweighted *n*	Weighted *n*[a]	SE[b]	Unweighted *n*	Weighted *n*[a]	SE[b]
Total						
1985–1988	837	516.8	21.2	242,104	147,902.4	1,111.8
1989–1992	1,098	561.4	20.8	293,323	153,800.1	1,103.9
1993–1996	914	622.8	27.3	236,035	160,159.6	1,935.8
1997–2000	650	456.1	22.3	241,917	167,753.6	764.0
Gender						
Men						
1985–1988	486	300.8	16.5	114,228	71,620.0	564.8
1989–1992	612	319.7	14.3	138,721	74,856.3	561.3
1993–1996	521	354.4	21.1	112,065	78,340.9	982.3
1997–2000	344	244.5	15.5	115,438	82,172.1	409.7
Women						
1985–1988	351	216.0	14.3	127,876	76,282.4	574.6
1989–1992	486	241.7	13.1	154,602	78,943.8	567.7
1993–1996	393	268.3	16.0	123,970	81,818.7	971.7
1997–2000	306	211.6	14.0	126,479	85,581.5	396.9
Age						
18–39						
1985–1988	605	376.7	16.8	137,508	86,046.3	730.4
1989–1992	793	413.2	18.1	162,512	86,809.4	685.3
1993–1996	636	438.8	20.4	126,120	87,038.5	1,106.0
1997–2000	424	302.2	17.1	123,717	86,119.1	482.5
40–65						
1985–1988	232	140.2	12.4	104,596	61,856.0	491.4
1989–1992	305	148.2	9.3	130,811	66,990.7	515.8
1993–1996	278	183.9	15.2	109,915	73,121.1	905.4
1997–2000	226	153.9	12.1	118,200	81,634.4	446.3

[a]In thousands. [b]Standard error for weighted sample size in thousands.

Compared to adults in the general population, men with intellectual disability were overrepresented and those who were middle-aged (i.e., 40 to 65) were underrepresented. A significantly higher proportion of adults with intellectual disability were men in all but the 1997–2000 estimate. For adults in the general population, the proportion of women significantly exceeded that of men.

Tables 2, 3, and 4 contain national-level prevalence estimates of obese, overweight, and healthy weight adults with and without intellectual disability between 1985 and 2000. Each table presents the unweighted sample size, the prevalence based on statistically weighted analyses, and the corresponding 95% confidence interval. Prevalence estimates were based only on respondents whose BMI information was obtainable. Due to the redesign of the survey in 1997, the BMI information was collected from only one adult in each sampled household. Thus, the number of respondents with BMI information was smaller in the 1997–2000 data.

Table 2 presents the prevalence of obesity by the presence of intellectual disability between the 1985–1988 and the 1997–2000 periods. The prev-

Table 2 Prevalence of Obese Adults by the Presence of Intellectual Disability (ID) by Gender and Age, 1985–2000

	Adults with ID			Adults without ID[c]		
Characteristic	*n*[a]	%[b]	95% CI (±)	*n*[a]	%[b]	95% CI (±)
Total[d]						
1985–1988	165	19.43	2.96	28,463	11.38	0.18
1989–1992	260	23.67	2.82	39,775	13.36	0.18
1993–1996	246	27.41[c]	3.39	37,730	16.01	0.22
1997–2000	56	34.60[c]	7.98	22,452	20.58	0.27
Gender						
Men						
1985–1988[d]	87	17.88	3.59	12,933	11.20	0.22
1989–1992[d]	116	19.36	3.33	18,469	13.33	0.22
1993–1996[d]	120	23.89	4.21	17,888	16.17	0.25
1997–2000	22	26.45	10.39	9,825	20.39	0.41
Women[d]						
1985–1988	78	21.57	5.64	15,530	11.55	0.25
1989–1992	144	29.34[e]	4.59	21,306	13.40	0.24
1993–1996	126	32.12	5.61	19,842	15.86	0.27
1997–2000	34	44.24[c]	11.72	12,627	20.75	0.37
Age						
18–39[d]						
1985–1988	116	19.10	3.55	12,357	8.76	0.20
1989–1992	181	22.88	3.39	17,519	10.65	0.20
1993–1996	168	27.73	4.02	16,455	13.01	0.25
1997–2000	33	33.69[c]	10.49	9,749	17.31	0.37
40–65						
1985–1988	49	20.29	5.96	16,106	15.04[f]	0.29
1989–1992[d]	79	25.94	5.21	22,256	16.89[f]	0.25
1993–1996[d]	78	26.66	6.08	21,275	19.60[f]	0.29
1997–2000	23	36.04	12.58	12,703	24.05[f]	0.41

[a]Unweighted sample size. [b]Proportion based on statistically weighted sample size. [c]Prevalence estimate is significantly different across years using 95% confidence interval. [d]Prevalence estimate for adults with intellectual disability is significantly higher than that for adults without intellectual disability using 95% confidence interval. [e]Prevalence estimate for women with intellectual disability is significantly higher than for men with intellectual disability using 95% confidence interval. [f]Prevalence estimate for older adults, ages 40–65, without intellectual disability is significantly higher than for younger adults, ages 18–39, without intellectual disability using 95% confidence interval.

alence among adults with intellectual disability estimated for the 1993–1996 period and the 1997–2000 period—27.41% (95% confidence interval ± 3.39) and 34.6% (±7.98), respectively—was significantly higher than that from the 1985–1988 period (19.43%, ± 2.96). The 1997–2000 prevalence was also significantly higher than the 1989–1992 prevalence of 23.67% (±2.82). Broken down by gender and age, a significant difference between the 1985–1988 prevalence and the 1997–2000 prevalence was found for women and adults ages 18 to 39. An increase in the obesity prevalence, though not signif-

Table 3 Prevalence of Overweight Adults by the Presence of Intellectual Disability (ID) by Gender and Age, 1985–2000

	Adults with ID			Adults without ID		
Characteristic	*n*[a]	%[b]	95% CI (±)	*n*[a]	%[b]	95% CI (±)
Total						
1985–1988	216	27.32	3.31	71,643	29.95[d]	0.24
1989–1992[c]	278	26.67	2.86	90,817	31.40[d]	0.20
1993–1996[c]	256	29.33	3.53	76,062	33.12[d]	0.24
1997–2000	49	28.86	7.31	35,787	34.06[d]	0.31
Gender						
Men[c]						
1985–1988	130	29.26	4.49	45,027	39.72[de]	0.33
1989–1992	166	28.25	3.86	56,979	41.35[de]	0.29
1993–1996	168	33.87[e]	4.96	47,171	42.92[de]	0.33
1997–2000	27	30.13	10.02	20,336	43.01[de]	0.49
Women						
1985–1988	86	24.64	5.57	26,616	20.70[d]	0.29
1989–1992	112	24.59	4.02	33,838	21.84[d]	0.22
1993–1996	88	23.27	4.76	28,891	23.59[d]	0.27
1997–2000	22	27.37	10.80	15,451	26.19[d]	0.39
Age						
18–39						
1985–1988	148	25.76	3.53	33,731	24.90[d]	0.29
1989–1992	185	24.44	3.25	43,295	27.02[d]	0.25
1993–1996	160	27.03	3.96	35,786	29.18[d]	0.29
1997–2000	30	30.48	9.70	16,516	30.63[d]	0.43
40–65						
1985–1988	68	31.43	6.53	37,912	37.02[f]	0.33
1989–1992	93	33.05	5.78	47,522	37.10[f]	0.27
1993–1996	96	34.70	6.31	40,276	37.85[df]	0.33
1997–2000	19	26.29	10.31	19,271	37.70[f]	0.47

[a]Unweighted sample size. [b]Proportion based on statistically weighted sample size. [c]Prevalence estimate for adults with intellectual disability is significantly lower than that for adults without intellectual disability using 95% confidence interval. [d]Prevalence estimate is significantly different across years using 95% confidence interval. [e]Prevalence estimate for men is significantly higher than for women in the same period using 95% confidence interval. [f]Prevalence estimate for older adults, ages 40–65, without intellectual disability is significantly higher than for younger adults, ages 18–39, without intellectual disability using 95% confidence interval.

icant, was also found for men and the middle-aged adult cohort with intellectual disability. Within the group with intellectual disability, women and middle-aged adults tended to report a higher rate of obesity than did men and young adults. However, the differences were generally not significant.

For adults who did not have intellectual disability, there was a steady increase of the obesity

Table 4 Prevalence of Adults With Healthy Weight by Presence of Intellectual Disability (ID) by Gender and Age, 1985–2000

	Adults with ID			Adults without ID[c]		
Characteristic	*n*[a]	%[b]	95% CI (±)	*n*[a]	%[b]	95% CI (±)
Total[d]						
1985–1988	378	47.74	3.59	128,861	54.96	0.31
1989–1992	460	43.30	3.29	147,344	51.99	0.24
1993–1996	333	38.34	3.80	108,235	47.89	0.29
1997–2000	55	33.75[c]	7.76	43,313	43.19	0.35
Gender						
Men						
1985–1988	224	47.55	4.96	53,145	47.75	0.37
1989–1992	271	45.52	4.37	59,572	44.12	0.31
1993–1996	195	38.34	4.90	43,183	39.79	0.37
1997–2000	33	39.42	11.45	16,309	35.75	0.49
Woman[d]						
1985–1988	154	48.01	5.92	75,716	61.79[e]	0.39
1989–1992	189	40.38	4.63	87,772	59.56[e]	0.33
1993–1996	138	38.35	5.76	65,052	55.78[e]	0.37
1997–2000	22	27.04[c]	10.23	27,004	49.73[e]	0.47
Age						
18–39[d]						
1985–1988	278	48.97	4.37	82,512	61.41[f]	0.35
1989–1992	353	45.56	4.02	91,649	57.93[f]	0.31
1993–1996	244	39.79	4.55	65,292	53.77[f]	0.37
1997–2000	33	32.31[c]	10.23	25,103	49.08[f]	0.49
40–65						
1985–1988	100	44.48	6.31	46,349	45.94	0.39
1989–1992	107	36.84[d]	5.74	55,695	44.26	0.31
1993–1996	89	34.99	6.96	42,943	40.86	0.37
1997–2000	22	36.05	12.29	18,210	36.95	0.47

[a]Unweighted sample size. [b]Proportion based on statistically weighted sample size. [c]Prevalence estimate is significantly different across years using 95% confidence interval. [d]Prevalence estimate for adults with intellectual disability is significantly lower than that for adults without intellectual disability using 95% confidence interval. [e]Prevalence estimate for women without intellectual disability is significantly higher than for men without intellectual disability using 95% confidence interval. [f]Prevalence estimate for younger adults, ages 18–39, without intellectual disability is significantly higher than for older adults, ages 40–65, without intellectual disability using 95% confidence interval.

prevalence over the years. It increased significantly for each time period from 1985–1988 (11.38%, ± 0.18) to 1997–2000 (20.58%,± 0.27). The increases were significant across all subgroups. The prevalence of obesity among adults in the general population did not differ significantly across gender, but was significantly higher for adults in the 40- to 65-year age group. When compared between adults with and without intellectual disability, the overall prevalence of obesity was significantly higher for

adults with intellectual disability. Comparisons between the two groups across gender and age revealed generally greater obesity among persons with intellectual disability, with only a few exceptions.

Table 3 summarizes the prevalence of individuals who were overweight by the presence of intellectual disability between the 1985–1988 and 1997–2000 periods. The proportion of overweight persons with intellectual disability did not appear to have changed across the four time periods. Differences by gender and age cohorts were largely not significant. In contrast, the proportion of overweight individuals in the general population increased consistently across each time period from 29.95% (± 0.24) in 1985–1988 to 34.06% (±0.31) in 1997–2000. Although the increase was relatively small when compared to increases for rates of obesity, it was still significant. The growth in overweight prevalence was found in both genders and among young adults ages 18 to 39. However, for adults in the general population who ranged in age from 40 to 65, the proportion of overweight individuals remained stable across years. Overall, the proportion of overweight individuals among Americans with intellectual disability was lower than in the general population. The difference, however, was not always significant. When broken down by gender, men with intellectual disability consistently had a lower proportion of overweight individuals than did men in the general population.

Proportions of adults with healthy weight from 1985–1988 to 1997–2000 are presented in Table 4. The overall percentage of healthy weight adults with intellectual disability in 1997–2000 (33.75%, ± 7.76) was significantly lower than that of 1985–1988 (47.74%, ± 3.59). A significant difference between the 1985–1988 and the 1997–2000 estimates was found for two subgroups with intellectual disability: women and young adults. For adults in the general population, the overall percentage of individuals with healthy weight dropped from 54.96% (±0.31) in 1985–1988 to 43.19% (±0.35) in 1997–2000. The decline was consistent across all subgroups. Women and younger adults in the general population were more likely to remain in the healthy weight category than were men and older adults. Comparing the two groups with and without intellectual disability, the overall proportion with healthy weight among adults with intellectual disability was significantly lower than in the general population across years. The discrepancy across the two groups appears to be attributable to that of two subgroups: women and young adults.

In summary, a large proportion of adults with intellectual disability was likely to be either obese or overweight. Across years, the prevalence of obesity among adults with intellectual disability was increasing and was higher than that for the general population. There was no detectable trend for the proportion of individuals who were overweight among adults with intellectual disability—in sharp contrast to the increase found among the general population. Broken down by gender, the proportion of overweight men with intellectual disability was consistently lower than that of men in the general population. Similar to the general population, the proportion of individuals with healthy weight among adults with intellectual disability appeared to be decreasing over the years. Women and young adults with intellectual disability were less likely to be at a healthy weight than were their counterparts in the general population.

Discussion

Findings of the present study were consistent with previous studies in which a high prevalence of obese and overweight individuals among adults with intellectual disability were reported. By utilizing household survey data that are more representative than previous studies, I was able to underscore the relevance of the body weight status as a health indicator for individuals with intellectual disability who live outside of formal residential services.

There are at least three possible explanations for this result. First, individuals with intellectual disability might be less conscious of health risks associated with an excessive body weight (e.g., Edgerton, Gaston, Kelly, & Ward, 1994). Further, they might not be given adequate opportunities to gain knowledge of health risks as part of their experiences in community services (Jobling, 2001). Second, their income status, which is often low (Fujiura & Yamaki, 1997; Yamaki & Fujiura, 2002), could be another explanation. People with limited incomes were less likely to eat healthy food (Jeffery & French, 1996) and had fewer opportunities to engage in physical activities (Schoenborn & Barnes, 2002) than did their counterparts with higher incomes. Third, less restrictive living environments in the community may be associated with reduced supervision, and promotion of individual

choices may result in greater access to fast foods and less emphasis on physical activity for those who live in the community (Daley, 1996; Rimmer, Braddock, & Marks, 1995).

Thus, results of the present study suggest that many individuals with intellectual disability may be at a risk of developing chronic health conditions secondary to their primary impairment of intellectual disability. Individuals with an excessive body weight have a higher risk of developing many chronic conditions, such as hypertension, diabetes, heart diseases, arthritis, stroke, stress, depression, respiratory diseases, and sleep disorder (e.g., Eckel, 1997; National Institutes of Health, 1998; National Task Force on the Prevention and Treatment of Obesity, 2000; Pi-Sunyer, 1999). Increased prevalence of these conditions was found even among those who were moderately overweight (National Task Force on the Prevention and Treatment of Obesity, 2000; Pi-Sunyer, 1999). Because the prevalence of these conditions generally increases as a function of age, previous researchers (e.g., Janicki et al., 2002) have targeted older individuals with intellectual disability. The substantial prevalence of obese and overweight individuals among young adults with intellectual disability found in the present study suggests that this age cohort might have a risk of developing such conditions similar to its older counterpart.

For the majority of persons, body weight status is largely a function of lifestyle (U.S. Department of Health and Human Services, 2001). By eating nutritious and healthy foods and being physically active, for example, one can manage body weight. The use of public education and health promotion are common public health approaches to change lifestyle for the general population (U.S. Department of Health and Human Services, 2001). These practices, however, may not be effective for individuals with intellectual disability because they are likely to have difficulty in relating their current behavior to health consequences in the future (Spitalnik & White-Scott, 2001). At this time, little information exists on the effects of health-related behaviors and the application of preventive health programs among persons with intellectual disability. Need for additional research to explore these areas is pressing.

Interpretations of the present findings are subject to at least three methodological limitations. First, the Health Survey data utilized were based on self or proxy reporting. Thus, the information was subject to respondent's reporting error, memory retention, recall bias, and likelihood to respond in the socially desirable manner. The presence of mental retardation used to identify persons with intellectual disability and the body height and body weight information used to tabulate BMI were subject to such errors and biases. Second, in light of the redesign of the Health Survey in 1997, estimates for the 1997–2000 period might not be fully comparable to those from previous years. The differences found between the 1997–2000 period and the previous three periods could represent the changes in the survey administration and in the survey questions used to identify adults with intellectual disability rather than true changes in the BMI distribution. Third, although I attempted to obtain stable estimates by merging multiple years of data, estimates for adults with intellectual disability in general and for its subgroups in particular were based on a small number of respondents. Even if there was a true difference across subgroups, a significant difference might not be found because of relatively large confidence intervals. For example, I did not find a higher prevalence of obese and overweight individuals among women and middle-aged adults than in men and young adults as had previous researchers. Failure to find significant differences may be partially described by large confidence intervals associated with a small sample size.

Nonetheless, the shortage of population-level health information among adults with intellectual disability underscores the importance of monitoring the health status of Americans with intellectual disability at the state and national level. Absence of such targeted population-level information may limit our ability to respond to their emerging needs promptly (Horwitz, Kerker, Owens, & Zigler, 2000; U.S. Public Health Services, 2001). Individuals with intellectual disability who do not access formal disability services are likely to have higher health risks (Spitalnik & White-Scott, 2001). In light of the projection that many people with intellectual disability do not use formal disability services (Fujiura, 1998; Olney & Kennedy, 2001; Yamaki & Fujiura, 2002), efforts should be expended to further expand our knowledge of this segment of the population.

Body weight status has been identified as one of the 10 leading health indicators to monitor the nation's progress in reducing health risks and achieving longer and healthier lives for its citizens (U.S. Department of Health and Human Services,

2000). The data from this study signify that weight control must be promoted as a critical health agenda for all adults with intellectual disability as it is for the general population.

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Author:
Kiyoshi Yamaki, PhD, Research Assistant Professor, Department of Disability and Human Development, College of Applied Health Sciences, University of Illinois at Chicago, 1640 W. Roosevelt Rd., Chicago, IL 60608. E-mail: kiyoshiy@uic.edu

