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Research Paper

Intellectual disability is associated with increased risk for obesity in a nationally representative sample of U.S. children

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Abstract

Background: Data on obesity prevalence in children with intellectual disability (ID) are scarce.

Objective: We estimated rates of obesity among children aged 10–17 years with and without ID in a nationally representative dataset that included measures of child weight and ID status, as well as family meal frequency, physical activity, and sedentary behavior.

Methods: Chi-square tests compared prevalence of obesity, demographic and behavioral characteristics between children with and without ID as reported in the 2011 National Survey of Children's Health. Tests for interaction in logistic regression models determined whether associations between obesity and behavioral characteristics were different between children with/without ID.

Results: Obesity prevalence for children with ID was 28.9% and 15.5% for children without ID. After adjusting for age, sex, race/ethnicity and poverty level, the odds ratio was significantly 1.89 times greater among children with ID than among those without ID (95% CI: 1.14 to 3.12). Among children with ID, 49.8% ate at least one meal with family members every day compared to 35.0% without ID ($p < 0.002$), and 49.5% with ID participated in frequent physical activity compared to 62.9% ($p < 0.005$). Prevalence of obesity was higher among all children who ate family meals every day compared to fewer days per week, and the effect was significantly more pronounced among those with ID ($p = 0.05$).

Conclusions: Prevalence of obesity among youth with ID was almost double that of the general population. Prospective studies are needed in this population to examine the impact of consistent family mealtimes and infrequent physical activity.

Keywords: Intellectual disability; Children; Obesity prevalence

The epidemic of childhood obesity appears to affect all U.S. population subgroups, whether defined by race, ethnicity, income level or developmental disability status.[1–3] Studies of obesity rates in children with intellectual disabilities (ID) have often been based on small convenience samples and have used varying definitions of weight status and disability, yielding inconsistent results. Despite the methodological concerns, these studies in general have suggested that overweight and obesity may be even more prevalent among children and adolescents with ID than in those who develop typically.

Substantial research evidence suggests that childhood obesity is associated with serious health consequences,[1]

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including high blood pressure, Type 2 diabetes,[4] and possible musculoskeletal problems.[5] Of great concern, childhood obesity is a predictor of obesity in adult life,[6] which has been implicated in Type 2 diabetes, hypertension, coronary artery disease, stroke, respiratory complications, arthritis, and some cancers.[7] For individuals with ID, these medical conditions may increase functional limitations that threaten further their opportunity to live in the least restrictive, most independent setting.

According to the American Association of Intellectual and Developmental Disabilities, ID originates before the age of 18 and is characterized by significant limitations in both intellectual functioning and in adaptive behavior. Intellectual functioning, which includes learning, reasoning, and problem solving, is often measured by IQ test scores which average 100 in the general population. A score of around 70–75 is considered to indicate a limitation in intellectual functioning. Adaptive behavior includes conceptual, social and practical domains.[8] ID is found in approximately 1% of the US population,[9] and affected persons often have other associated conditions such as autism, attention deficit disorder, sensory and motor impairments, and depression.[10]

Data on weight status in children with ID are scarce. Internationally, a study in France of 87 adolescents with ID found that 25.3% were overweight or obese.[11] Another study of 410 French adolescents with ID found a lower prevalence of 19% combined overweight and obesity, which was nevertheless higher than 13.6%, the cited rate in typically developing adolescents in France.[12] Obesity prevalence was 36% in a study of 206 Scottish children with mild to moderate ID, significantly greater than the general population.[13]

In the U.S. 2003 National Survey of Children's Health (NSCH), 19.3% of 5945 children identified as having learning disabilities (a category that includes academic learning problems but at least average intelligence) were obese after adjusting for covariates, compared to 12.2% of 40,762 children without a chronic condition such as learning disability.[2] However, the 2003 NSCH did not include ID as a separate category. In another study that collected data from a convenience sample of parents reporting weight status of 82 adolescents with ID, 12.4% of the youth were obese after adjusting for covariates. This was a non-significant difference when the authors compared this obesity rate to the rate of 13.0% that was reported in the concurrent national 2007 Youth Risk Behavior Survey of high school students without disability. However, diagnoses such as autism and Down syndrome that are often associated with ID were considered separately, and 159 youths with autism and 81 youths with Down Syndrome had significantly higher obesity prevalence than the reference group: 24.6% and 31.2% respectively.[14]

Given the general data scarcity and the variability in children's obesity rates and methodology in previous studies, we sought a reliable estimate of ID as a primary condition by analyzing results of a large representative data set. The NSCH, a nationally representative survey conducted by the Center for Disease Control's (CDC) National Center for Health Statistics, has included estimates of overweight and obesity prevalence based on parent report since 2003. The most recent wave of surveys conducted in 2011–2012 was the first to include items characterizing children as with/without ID along with the information on weight status. Information in the NSCH also allowed users to assess how weight status is affected by associated medical conditions as well as behavioral risk factors associated with obesity, such as mealtimes and physical activity. We hypothesized that disparities in the prevalence of obesity between children with and without ID would correlate with patterns of mealtimes, physical activity, and sedentary behaviors such as television viewing and electronic device use.

Methods

The 2011–2012 NSCH is a nationally representative survey conducted by the CDC's National Center for Health Statistics, administered as a module of the State and Local Area Integrated Telephone Survey. Households were sampled via random digit dialing of land-lines, supplemented with an independent sample of cell phone numbers. The survey screened households for the presence of children aged 0–17 years, and one child was randomly selected to be the survey subject. The questions were answered by a parent or guardian in the household with knowledge of the child's health. The overall response rate for 2011–2012 was 23.0%, resulting in a total of 95,677 parent interviews completed from February 2011 through June 2012. For more information about NSCH, including its sample design, data collection procedures, and questionnaire content, visit http://www.cdc.gov/nchs/slaits/nsch.htm. This public use data set is available through the Data Resources Center for Child and Adolescent Health (www.childhealthdata.org).[15]

After reviewing the NCHS codebook, we decided a priori to use ID status, weight, and available items that were most closely related to caloric intake and energy expenditure. The Tufts University Institutional Review Board deemed that the study, a collaborative effort of members of the Healthy Weight Research Network led by Tufts University researchers, was exempt, given that the data were publicly available and de-identified.

Assessment of ID status

Parent report of current ID was based on responses to two questions. Parents were first asked if they had ever been told by a doctor or other health care provider that their child had "an intellectual disability or mental retardation?" Parents who answered "yes" to this question were given a follow-up question: "Does [child] currently have an intellectual disability or mental retardation?" In this analysis,