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RESEARCH PERTAINING TO OBESITY AND PEOPLE WITH DISABILITIES

DEVELOPMENTAL/INTELLECTUAL DISABILITIES

Position of the American Dietetic Association: Providing nutrition services for people with developmental disabilities and special health care needs.

Van Riper CL, Wallace LS; American Dietetic Association. The University of Nebraska Medical Center Munroe-Meyer Institute, Omaha, NE, USA. J Am Diet Assoc. 2010 Feb;110(2):296-307.

It is the position of the American Dietetic Association that nutrition services provided by registered dietitians (RDs) and dietetic technicians, registered (DTRs), are essential components of comprehensive care for all people with developmental disabilities and special health care needs. Nutrition services should be provided throughout life in a manner that is interdisciplinary, family-centered, community-based, and culturally competent. People with developmental disabilities and special health care needs frequently have nutrition concerns, including growth alterations (failure to thrive, obesity, or growth retardation), metabolic disorders, poor feeding skills, medication-nutrient interactions, and sometimes partial or total dependence on enteral or parenteral nutrition. Individuals with special needs are also more likely to develop comorbid conditions such as obesity or endocrine disorders that require nutrition interventions. Poor health habits, limited access to services, and long-term use of multiple medications are considered health risk factors. Health maintenance and avoidance of complications can be promoted by timely and cost-effective nutrition interventions. Public policy for individuals with special needs has evolved over time, resulting in a transition from institutional facilities and programs to community living. The expansion of public access to technology and health information on the Internet challenges RDs and DTRs to provide accurate scientific information for those with developmental disabilities and special health care needs. Nationally credentialed RDs and DTRs are best prepared to provide appropriate nutrition information for wellness and quality of life.

The Healthy Lifestyle Change Program: a pilot of a community-based health promotion intervention for adults with developmental disabilities.

Bazzano AT, Zeldin AS, Diab IR, Garro NM, Allevato NA, Lehrer D; WRC Project Oversight Team. Collaborators (12) Azantian C, Converse K, Eis J, Feeman B, Fisher D, Johnson E, Kelly TJ, O'Brien C, Rivas T, Smith G, Stusser M, Weller K.

Department of Health Services, UCLA School of Public Health, University of California-Los Angeles, CA 90095, USA. abazzano@ucla.edu Am J Prev Med. 2009 Dec;37(6 Suppl 1):S201-8.

BACKGROUND: Although adults with developmental disabilities are at high risk for obesity and its sequelae, few community-based lifestyle interventions targeting those with developmental disabilities exist.

DESIGN: The study was a single group, community-based demonstration project with pre-post test evaluation conducted from December 2005 to June 2006.

SETTING/PARTICIPANTS: Eligible participants were 431 community-dwelling adults with developmental disabilities, aged 18-65 years, who were overweight/obese (BMI > or =25) with another risk factor for diabetes or metabolic syndrome or who had a diagnosis of diabetes, and received services from a community agency. Eighty-five signed up (20% of those eligible), 68 participated in an initial class, and 44 completed the program (35% attrition rate).

INTERVENTION: The Healthy Lifestyle Change Program (HLCP) is a community-based health intervention developed and implemented using community-based participatory research methods by members of the developmental disabilities community, in collaboration with academic researchers. The HLCP was a 7-month, twice-weekly education and exercise program to increase knowledge, skills, and self-efficacy regarding health, nutrition, and fitness among adults with developmental disabilities. Peer mentors served as participant leaders and primary motivators.

MEASURES: Changes in weight, BMI, abdominal girth, access to care, and self-reported nutrition, physical activity, and life satisfaction were each measured.

RESULTS: Two thirds of participants maintained or lost weight, with a mean weight loss of 2.6 pounds and a median weight loss of 7 lbs (range: 2-24 lbs). Average BMI decreased by 0.5 kg/m(2) (p=0.04). Abdominal girth decreased in 74% of participants (mean= -1.9 inches). Sixty-one percent of participants reported increased physical activity. Mean exercise frequency increased from 3.2 times to 3.9 times per week (p=0.01). Mean exercise duration increased from 133 minutes to 206.4 minutes per week (p=0.02). Significant improvements in nutritional habits and self-efficacy were reported. Over half (59%) of participants showed improvements in life satisfaction. Participants received 206 referrals for needed medical care. The HLCP and its dissemination increased participants' and peer mentors' ability to act as community advocates and partners in research.

CONCLUSIONS: The HLCP resulted in improved lifestyles, weight loss success, and increased community capacity, indicating that a community-based program with significant participation of those with developmental disabilities is feasible. This program should be expanded and evaluated with larger populations with developmental disabilities.

Nutrition and adults with intellectual or developmental disabilities: systematic literature review results.

Humphries K, Traci MA, Seekins T. University of Montana Rural Institute on Disabilities, Research Unit, Missoula, MT, USA. khumphries@ruralinstitute.umt.edu Intellect Dev Disabil. 2009 Jun;47(3):163-85.

Approximately 4.5 million Americans have an intellectual or developmental disability. Concern is increasing about these individuals' nutrition-related behavior and its implications for their health. This article reports on a systematic search of the current literature listed in the PsycINFO and PubMed databases related to nutritional status of adults with intellectual or developmental disabilities. The authors used key terms for nutrition, secondary conditions, and intellectual and developmental disability and categorized literature pertaining to nutrition-related studies of adults with intellectual or developmental disabilities as follows: dietary intake studies, anthropometric assessments of nutritional risks, biochemical indexes, and clinical evaluations.

Weight loss and dietary improvements following the Healthy Lifestyle Change Program, a community-based intervention for adults with developmental disabilities

Zeldin A, Shihady I, Garro N, Lehrer D, Eis J, Bazzano L, Bazzano A. Department of Neurosciences, UCSD/Rady Children's Hospital, San Diego, CA; Westside Regional Center, Culver City, CA; Tulane University School of Public Health and Tropical Medicine and School of Medicine, New Orleans, LA; UCLA School of Public Health - Health Services, Los Angeles, CA. The FASEB Journal. 2008;22:682-7.

OBJECTIVE: People with developmental disabilities (DD) are at high risk for obesity due to inactivity, poor diet and medication effects. Our goal was to evaluate the effect of an intervention designed for adults with DD on weight loss and dietary habits.

METHODS: A pre-post test design was used to evaluate the Healthy Lifestyle Change Program (HLCP), a 7-mo program to improve dietary habits and reduce obesity in adults with DD with BMI≥25. Forty-five participants completed nutrition and exercise sessions twice weekly for 7 mos. Abdominal girth, dietary habits, nutrition knowledge, weight satisfaction, weight and BMI were measured at baseline and 7 mos.

RESULTS: Two-thirds of participants maintained or lost weight. Mean weight loss was 3 lbs ($p=0.03$) and BMI change was –0.5 ($p=0.04$). Abdominal girth decreased by a mean of 1 in. ($p=0.005$). An increase in weight satisfaction was reported by 43% ($p=0.0001$). Participants reported significantly improved diet. Water and nutrient-dense food intake increased significantly ($p<0.0001$), while intake of energy-dense snacks, fast foods and soda decreased. Nutrition knowledge improved on recommended servings of fruits, carbohydrates, whole grain products and risks of fried foods ($p\leq0.05$)

CONCLUSION: The HLCP is an effective strategy to improve dietary habits and knowledge and decrease abdominal girth and weight for adults with DD.

Following up fighting fit: the long-term impact of health practitioner input on obesity and BMI amongst adults with intellectual disabilities.

Chapman MJ, Craven MJ, Chadwick DD. Manchester Learning Disability Partnership, UK. melanie.chapman@manchester.gov.uk J Intellect Disabil. 2008 Dec;12(4):309-23.

This article presents findings on the long-term impact of health practitioner input to reduce obesity amongst adults with intellectual disabilities. Body mass index (BMI) was measured for an input group (N = 33) and a comparison group (N = 40) 6 years after the input group first received input. Data on BMI were collected at baseline, 6 months, 1 year and 6 years. Mean BMI for the input group reduced steadily over 6 years. Mean BMI in the non-input group rose initially, stabilized and then decreased (although remaining higher than at baseline). The input group demonstrated improvements in obesity levels and lost more weight than the non-input group. However, the differences between groups did not reach statistical significance. This and the improvements in BMI within the non-input group may be due to the relatively small sample size, effect size and the impact of other local initiatives.

A review of weight loss interventions for adults with intellectual disabilities.

Hamilton S, Hankey CR, Miller S, Boyle S, Melville CA. Section of Psychological Medicine, University of Glasgow, Glasgow, UK. Obes Rev. 2007 Jul;8(4):339-45.

Obesity is more prevalent in adults with intellectual disabilities than in the general population, and has been shown to contribute to their reduced life expectancy, and increased health needs. Relatively few studies have examined the effectiveness of weight loss interventions for adults with intellectual disabilities. However, there is evidence to support interventions that take account of the context of the lives of adults with intellectual disabilities, including carer involvement in interventions. To reduce the health inequalities experienced by adults with intellectual disabilities, there is a clear need to develop accessible, evidence-based clinical weight management services.

Obesity and intellectual disability.

Rimmer JH, Yamaki K. Department of Disability and Human Development, University of Illinois at Chicago, Chicago, IL 60608-6904, USA. jrimmer@uic.edu Ment Retard Dev Disabil Res Rev. 2006;12(1):22-7.

While much of the industrialized world struggles for clues to the growing rise in obesity in their respective countries, researchers and service providers involved in understanding the health characteristics and health behaviors of persons with intellectual disability (ID) struggle with their own issues regarding the increased prevalence of obesity in this segment of the population. What is particularly alarming is that adults with ID residing in the United States in smaller, less supervised settings (e.g., group homes and family households) have a significantly higher rate of obesity compared to other countries and those living in larger and more supervised settings (e.g., institutions). These differences support the theory that the environment appears to exert a powerful influence on obesity in this population. Obesity presents a substantial threat to the livelihood of persons with

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ID and may have an effect on community participation, independent living, and healthy years of life. The lack of research on successful weight reduction strategies for obese persons with ID makes this an important and greatly needed area of research.

Fighting fit? An evaluation of health practitioner input to improve healthy living and reduce obesity for adults with learning disabilities.

Chapman MJ, Craven MJ, Chadwick DD. Manchester Learning Disability Partnership, Chorlton, UK. melanie.chapman@manchester.gov.uk J Intellect Disabil. 2005 Jun;9(2):131-44.

People with learning disabilities are at high risk of obesity and consequent health risks. This study aimed to (1) describe levels of obesity for adults supported by learning disability services, and to (2) evaluate the effectiveness of health practitioner input with individuals with learning disabilities. Body mass index (BMI) was measured at 6 month intervals and change in BMI over time was compared between a non-input group and a group receiving practitioner input to improve healthy living. Initially 35 percent of the non-input sample was classified as clinically obese. Mean BMI increased over time for the non-input group at first, but decreased for the group that received practitioner input. The differences in weight change between the two groups reached statistical significance with a greater weight reduction in the input group. Implications for service provision are discussed.

Obesity among people with and without mental retardation across adulthood.

Moran R, Drane W, McDermott S, Dasari S, Scurry JB, Platt T. Department of Epidemiology and Biostatistics, University of South Carolina School of Public Health, Columbia, South Carolina, USA. Obes Res. 2005 Feb;13(2):342-9.

OBJECTIVE: This study was designed to explore obesity during adulthood and the likelihood of moving out of obesity among 1809 adults without disability and 680 adults with mental retardation who received care at the same primary care practices during the period of 1990 to 2003. Research Method and Procedures: A retrospective observational design using medical records first identified patients with mental retardation (MR) and age-matched controls without disabilities. Data on BMI collected during each primary care visit allowed exploration of obesity at three levels. Moving out of obesity was defined as having a BMI <25 kg/m(2). We also abstracted data on age, sex, race, and other medical conditions.

RESULTS: For adults 20 to 29 years of age, 33.1% of patients without disability and 21% of patients with MR had a BMI >30 kg/m(2). Between the ages of 50 and 59 years, 40.5% of the patients without disability and 35.2% of the patients with MR had a BMI >30 kg/m(2). Patients with mild MR had similar prevalence rates of obesity and patients with severe MR had significantly lower prevalence of obesity compared with the patients without disability through 50 years of age. Throughout the period from 20 to 60 years of age, between 15% and 40% of individuals with and without MR, who were previously obese, were not currently obese.

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DISCUSSION: Throughout the adult years, an increasing proportion of individuals with and without MR are obese. However, obesity is not a chronic state; many people transition back to a normal body weight.

DEVELOPMENTAL/INTELLECTUAL DISABILITIES, ADOLESCENTS WITH

Behavioral health in developmental disabilities: a comprehensive program of nutrition, exercise, and weight reduction.

Fleming RK, Stokes EA, Curtin C, Bandini LG, Gleason J, Scampini R, Maslin MC, Hamad C. Eunice Kennedy Shriver Center at UMASS, Medical School, Trapello Road, Waltham, MA. Int J Behav Consult Ther. 2008 Jan 1;4(3):287-296.

We review the literature on the prevalence and conditions resulting in overweight and obesity in people with intellectual disability (ID), followed by obesity treatment research with typically developing children and adaptations for children with ID. In addition to proposing directions for future research and practice, we report a comprehensive randomized control trial (RCT) of family-based behavioral intervention targeting weight loss among adolescents with Down syndrome.

The efficacy of a 9-month treadmill walking program on the exercise capacity and weight reduction for adolescents with severe autism.

Pitetti KH, Rendoff AD, Grover T, Beets MW. Department of Physical Therapy, College of Health Professions, Wichita State University, Wichita, KS 67260-0043, USA. ken.pitetti@wichita.edu J Autism Dev Disord. 2007 Jul;37(6):997-1006.

This study evaluated the efficacy of a 9-month treadmill walking (TW) program on exercise capacity and body mass index (BMI) for adolescents with severe autism. Ten youth residing in a residential/school treatment facility were assigned to either a supplemental treadmill walking (TW) or control group. Both groups continued to participate in their regular physical education curriculum. Monthly records were maintained for the following: (a) TW progression in frequency, duration, speed and elevation; (b) caloric expenditure; and (c) BMI. The TW program resulted in significant increases in mean monthly TW frequency, speed, elevation, and calories expended coupled with a reduction in BMI.

DISABILITIES, ADULTS WITH

A randomized controlled trial to increase physical activity and reduce obesity in a predominantly African American group of women with mobility disabilities and severe obesity.

Rimmer JH, Rauworth A, Wang E, Heckerling PS, Gerber BS. Center on Health Promotion Research for Persons with Disabilities, Department of Disability and Human Development, University of Illinois at Chicago, 1640 West Roosevelt Rd., Chicago, IL 60608-6904, USA. jrimmer@uic.edu Prev Med. 2009 May;48(5):473-9.

OBJECTIVE: This randomized controlled trial tested a tailored, telephone-based physical activity coaching intervention for a predominantly African American group of women with severe obesity and mobility disability.

METHODS: We recruited 92 clinic patients from the University of Illinois at Chicago Medical Center referred by their physicians during 2004-2007 and randomized participants to one of three groups--awareness(informational brochure, no coaching), lower support (phone coaching only) and higher support (phone coaching plus monthly exercise support group)--to determine the efficacy of a tailored coaching intervention on key health outcomes, which included body weight and body mass index, blood pressure, cholesterol, physical activity (barriers and self-reported activity), movement and mobility, general health, and social support.

RESULTS: The higher support group had the greatest reduction in Body Mass Index (BMI) (7.4%) compared with a 0.2% and 1.6% increase in BMI for the lower support and awareness groups, respectively (pb.01). Both the higher and lower support groups had a greater increase in physical activity scores (39% and 30%, respectively) compared with a decline of 13% in the awareness group (pb.05).

CONCLUSION: Providing phone-based coaching and monthly in-person exercise support group sessions appear to be an effective approach for reducing body weight and increasing physical activity among severely obese, disabled adults residing in difficult social environments.

Physical activity among adults with a disability--United States, 2005.

Centers for Disease Control and Prevention (CDC). MMWR Morb Mortal Wkly Rep. 2007 Oct 5;56(39):1021-4.

The health benefits of physical activity have been well documented and are supported by recommendations from Healthy People 2010 (focus area 22); however, fewer than half of U.S. adults follow these recommendations. Physical inactivity is particularly prevalent among adults with a disability, who are at increased risk for functional limitations and secondary health conditions (e.g., obesity, depression, or social isolation) that can result from their disabilities, behavior, lifestyle, or environment. To estimate the state-specific prevalence of physical activity and physical inactivity among adults with and without a disability, CDC analyzed data from the 2005 Behavioral Risk Factor Surveillance System (BRFSS). This report summarizes the results of that analysis, which determined that, compared with adults without a disability, a smaller proportion of adults with a disability met national recommendations for physical activity (37.7% versus 49.4%), and a greater proportion were physically inactive (25.6% versus 12.8%). Public health measures to promote and increase physical activity should include consideration for the needs of adults with disabilities.

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The experience of being disabled and obese.

Pain H, Wiles R. Salisbury Healthcare NHS Trust, Salisbury, UK. thriveuk@btconnect.com Disabil Rehabil. 2006 Oct 15;28(19):1211-20.

PURPOSE: This qualitative study was designed to explore the experiences of disabled and severely obese people living in the community. The challenges that their size and disabilities posed within their homes and in accessing community facilities were explored, with particular reference to the provision and use of assistive technologies.

METHODS: The study comprised in-depth interviews with a sample of six severely obese, disabled people using a grounded theory approach.

RESULTS: Three key themes emerged: the experience of daily life; accessing services; and responses to challenges. The study participants found that their home and community environments were seldom adequate for their size. Difficulties were identified in relation to accessing and using NHS services and negative attitudes and treatment from staff. Assessments and quality of assistive devices and housing adaptations received were criticised by some. Participants identified a range of responses to these challenges.

CONCLUSION: The challenges that obesity bring are compounded by disability, including the need for higher levels of care and the higher costs of assistive devices for this client group. The study suggests there may be a need for training for professionals who work with obese, disabled people to ensure their needs are met in appropriate and cost-effective ways.

Physical disability and obesity.

Liou TH, Pi-Sunyer FX, Laferrère B. New York Obesity Research Center, St. Luke's-Roosevelt Hospital, Institute of Human Nutrition, College of Physicians and Surgeons, Columbia University, New York, USA. Nutr Rev. 2005 Oct;63(10):321-31.

Nearly 20% of US citizens are disabled. Epidemiologic studies have shown that people with physical disabilities have a 1.2- to 3.9-fold increase in obesity prevalence. Obesity is becoming a serious problem in disabled individuals. The mechanisms by which obesity occurs in people with physical disabilities is not clear, but pathophysiological changes of body composition and energy metabolism, physical inactivity, and muscle atrophy all favor the development of obesity. Health professionals should identify disabled patients at risk and provide early prevention guidance. Research is needed to help generate detailed clinical guidelines to promote weight control among people with physical disabilities.

Obesity prevalence among a group of Chicago residents with disabilities.

Rimmer JH, Wang E. Department of Disability and Human Development and College of Nursing, University of Illinois, Chicago, IL 60608-6904, USA. jrimmer@uic.edu Arch Phys Med Rehabil. 2005 Jul;86(7):1461-4.

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OBJECTIVE: To examine the prevalence of overweight, obesity, and extreme obesity in a predominantly minority group of adults with disabilities. DESIGN: Cross-sectional study using secondary data analysis.

SETTING: Major university medical center.

PARTICIPANTS: Adults with physical and cognitive disabilities (N = 306).

INTERVENTIONS: Not applicable.

MAIN OUTCOME MEASURES: Direct measures of height and weight to classify subjects into 3 obesity categories: overweight (body mass index [BMI] range, 25-29.9 kg/m2), obese (BMI range, 30-39.9 kg/m2), and extreme obesity (BMI, > or = 40 kg/m2).

RESULTS: People with disabilities, regardless of sex, race and ethnicity, or age, had significantly higher rates of overweight, obesity, and extreme obesity compared with people without disabilities. Extreme obesity (BMI, > or = 40 kg/m2) was approximately 4 times higher among people with disabilities than in the general population (odds ratio = 4.08; 95% confidence interval, 3.50-4.66). There were also substantial differences in obesity prevalence among people with disabilities, using actual measurement data, compared with self-reported data from previously published data sets.

CONCLUSIONS: The disparity in excess body weight between people with and without disabilities, particularly in the category of extreme obesity, along with substantial differences in obesity prevalence between actual and self-reported data, show a critical need to better understand why these differences exist.

DISABILITIES, CHILDREN AND ADOLESCENTS WITH

Sports and disability.

Wilson PE, Clayton GH. Department of Physical Medicine & Rehabilitation, B-285, The Children's Hospital, Aurora, CO. PM R. 2010 Mar;2(3):S46-S54.

Participation in recreational and competitive sports at an early age has long been touted as a positive influence on growth and development, and for fostering lifelong healthy lifestyles. The benefits of an active lifestyle include not only fitness, but the promotion of a sense of inclusion and improved self-esteem. These benefits are well documented in all populations, and their importance has been summarized in the recent Healthy People 2010 guidelines. The American Academy of Pediatrics has recently produced a summary statement on the benefits of activity for disabled children. They note that children with disabilities tend to have an overall lower level of fitness and an increased level of obesity. For this population, developing a lifelong desire to be active can be a simple means for limiting illness and much of the morbidity associated with sedentary lifestyles often associated with disability. For disabled youth, participation in disabled

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sports programs available nationally and internationally can be an effective means to promote such precepts. The goal of this focused review is to improve the learner's knowledge of the positive impact that active lifestyles can have on overall health in the disabled youth population and, as a result, modify their practice by incorporating recreational and competitive sport activities as part of improving overall patient care.

Update on physical activity including special needs populations.

Keeton VF, Kennedy C. Department of Family Healthcare Nursing, University of California-San Francisco, 2 Koret Way, San Francisco, CA 94143, USA. victoria.keeton@nursing.ucsf.edu Curr Opin Pediatr. 2009 Apr;21(2):262-268.

PURPOSE OF REVIEW: Childhood obesity rates remain high, especially among adolescents, minorities, and children with disabilities. The American Academy of Pediatrics and American Medical Association have released recommendations for childhood obesity treatment and prevention which include interventions related to physical and sedentary activity. This review explores recent updates in the area of physical activity and sedentary behavior related to these recommendations as well as emerging evidence relevant to physical activity among children with disabilities.

RECENT FINDINGS: Safety and access are among some of the environmental barriers to children's participation in extracurricular physical activity that need to be addressed. Analyses of the relationship between physical activity and sedentary screen time continue to show inconsistent results, although evidence in support of active video games is increasing. Children with disabilities are a special subpopulation for whom physical activity should particularly be encouraged.

SUMMARY: Increased physical activity and decreased sedentary behaviors are essential components of obesity management in children with and without disabilities. Pediatric providers are encouraged to address barriers to physical activity with all families and act as advocates for changes in the local community that support access to physical activity for all children.

Promoting the participation of children with disabilities in sports, recreation, and physical activities.

Murphy NA, Carbone PS; American Academy of Pediatrics Council on Children With Disabilities. Collaborators: Murphy NA, Cartwright JD, Desch LW, Duby JC, Elias ER, Liptak GS, Myers SM, Norwood KW Jr, Sagerman PJ, Tilton AH, Lipkin PH, Carbone PS, Lollar D, Macias M, Olson DG, Strickland B, Skipper SM. Pediatrics. 2008 May;121(5):1057-61.

The benefits of physical activity are universal for all children, including those with disabilities. The participation of children with disabilities in sports and recreational activities promotes inclusion, minimizes deconditioning, optimizes physical functioning, and enhances overall well-being. Despite these benefits, children with disabilities are more restricted in their participation, have lower levels of fitness, and have higher levels of obesity than their peers without disabilities. Pediatricians and parents may

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overestimate the risks or overlook the benefits of physical activity in children with disabilities. Well-informed decisions regarding each child's participation must consider overall health status, individual activity preferences, safety precautions, and availability of appropriate programs and equipment. Health supervision visits afford pediatricians, children with disabilities, and parents opportunities to collaboratively generate goal-directed activity "prescriptions." Child, family, financial, and societal barriers to participation need to be directly identified and addressed in the context of local, state, and federal laws. The goal is inclusion for all children with disabilities in appropriate activities. This clinical report discusses the importance of physical activity, recreation, and sports participation for children with disabilities and offers practical suggestions to pediatric health care professionals for the promotion of participation.

Physical activity for youth with disabilities: a critical need in an underserved population.

Rimmer JA, Rowland JL. Department of Disability and Human Development, National Center on Physical Activity and Disability, University of Illinois at Chicago, Chicago, IL 60608-7904, USA. jrimmer@uic.edu Dev Neurorehabil. 2008 Apr-Jun;11(2):141-8.

The recommended amount of daily physical activity for youth is 60 minutes a day, most days of the week. Youth with disabilities are not achieving this target and are significantly less active and more obese than their non-disabled peers. The combination of the health risks associated with physical inactivity and obesity presents a serious health concern in this population. While there is a small amount of research on interventions aimed at improving fitness among youth with disabilities, the majority of these studies were conducted in clinical settings where most or all of the common barriers to participation were eliminated (e.g. transportation, lack of knowledgeable staff, adaptation of programmes and/or facilities to child's needs). One of the most important challenges for paediatric rehabilitation and healthcare professionals is finding ways to increase physical activity and fitness among youth with disabilities in community-based settings. The use of information technology (IT) to customize physical activity programmes for youth with disabilities offers a promising approach to addressing this important health issue in the future.

Obesity and secondary conditions in adolescents with disabilities: addressing the needs of an underserved population.

Rimmer JH, Rowland JL, Yamaki K. Department of Disability and Human Development, University of Illinois at Chicago, Chicago, Illinois 60608-6904, USA. jrimmer@uic.edu J Adolesc Health. 2007 Sep;41(3):224-9.

Children and adolescents with physical and cognitive disabilities have a higher prevalence of overweight compared to their non-disabled peers. This health risk can lead to a greater number of obesity-related secondary conditions (e.g., fatigue, pain, deconditioning, social isolation, difficulty performing activities of daily living) and can impose significant personal and economic hardship on the child and family. Effective strategies for reducing the risk of overweight/obesity in adolescents with disabilities must begin with greater awareness of the behavioral and environmental antecedents that lead

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to higher rates of obesity in this underserved segment of the youth population. Research on interventions to reduce obesity among adolescents with disabilities is an important area of future research for public health scientists. A range of interventions will be necessary to overcome the many barriers that youth with disabilities experience in achieving and maintaining a healthy weight.

What does the epidemic of childhood obesity mean for children with special health care needs?

Minihan PM, Fitch SN, Must A. School of Medicine, Tufts University, MA, USA. J Law Med Ethics. 2007 Spring;35(1):61-77.

Bringing the 12.8% of children with special healthcare needs into the national response to the childhood obesity epidemic will require new information, a view of health promotion beyond that which occurs within healthcare systems, and services and supports in addition to the multi-sectoral strategies presently designed for children overall. These efforts are necessary to protect the health of the nation's 9.4 million children with special health care needs now and long-term.

MENTAL ILLNESS

Obesity among those with mental disorders: a National Institute of Mental Health meeting report.

Allison DB, Newcomer JW, Dunn AL, Blumenthal JA, Fabricatore AN, Daumit GL, Cope MB, Riley WT, Vreeland B, Hibbeln JR, Alpert JE. University of Alabama at Birmingham, Birmingham, Alabama, USA. Am J Prev Med. 2009 Apr;36(4):341-50.

The National Institute of Mental Health convened a meeting in October 2005 to review the literature on obesity, nutrition, and physical activity among those with mental disorders. The findings of this meeting and subsequent update of the literature review are summarized here. Levels of obesity are higher in those with schizophrenia and depression, as is mortality from obesity-related conditions such as coronary heart disease. Medication side effects, particularly the metabolic side effects of antipsychotic medications, contribute to the high levels of obesity in those with schizophrenia, but increased obesity and visceral adiposity have been found in some but not all samples of drug-naïve patients as well. Many of the weight-management strategies used in the general population may be applicable to those with mental disorders, but little is known about the effects of these strategies on this patient population or how these strategies may need to be adapted for the unique needs of those with mental disorders. The minimal research on weight-management programs for those with mental disorders indicates that meaningful changes in dietary intake and physical activity are possible. Physical activity is an important component of any weight-management program, particularly for those with depression, for which a substantial body of research indicates both mental and physical health benefits. Obesity among those with mental disorders has not received adequate research attention, and empirically-based interventions to

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address the increasing prevalence of obesity and risk of cardiovascular and metabolic diseases in this population are lacking.

Learning what matters for patients: qualitative evaluation of a health promotion program for those with serious mental illness.

Shiner B, Whitley R, Van Citters AD, Pratt SI, Bartels SJ. Department of Psychiatry, Dartmouth Medical School, Dartmouth-Hitchcock Medical Center, One Medical Center Drive, Lebanon, NH 03766, USA. brian.r.shiner@dartmouth.edu Health Promot Int. 2008 Sep;23(3):275-82. Epub 2008 Jun 13.

Sedentary lifestyle, poor dietary behaviors and metabolic alterations associated with psychiatric medications contribute to poor health and high rates of obesity among individuals with serious mental illness (SMI). Interventions that increase engagement in physical exercise, dietary modifications, lifestyle changes and preventive health care can provide health benefits across the lifespan. These interventions have led to substantial physical improvements in some persons with SMI, while others have not improved or have experienced worsening physical health. We set out to identify characteristics of a health promotion program that persons with SMI associated with physical health improvements. Interviews were conducted with eight participants from the In SHAPE health-promotion program who lost at least 10 pounds or diminished their waist circumference by at least 10 cm. Interviews aimed to determine which aspects of the program were perceived to be most helpful in promoting physical health improvement. Among successful participants, three themes emerged, highlighting the importance of: (i) individualized interventions promoting engagement in the program; (ii) relationships with health-promotion program employees and (iii) self-confidence resulting from program participation. Health-promotion programs that target these areas may have better success in achieving health benefits for persons with SMI.

Schizophrenia, obesity, and antipsychotic medications: what can we do?

Citrome L, Vreeland B. New York University School of Medicine, Department of Psychiatry, and the Nathan S. Kline Institute for Psychiatric Research, Orangeburg, NY 10962, USA. citrome@nki.rfmh.org Postgrad Med. 2008 Jul;120(2):18-33.

Obesity is one of the most common physical health problems among patients with severe and persistent mental illnesses, such as schizophrenia. Multifactorial in origin, obesity can be attributed to an unhealthy lifestyle as well as the effects of psychotropic medications such as second-generation antipsychotics. Excess body weight increases the risk for many medical problems, including type 2 diabetes mellitus, coronary heart disease, osteoarthritis, hypertension, and gallbladder disease. A PubMed search revealed 403 English-language citations to the query "schizophrenia" AND "obesity" and 469 citations to the query "obesity" AND "antipsychotics." The evidence is that different antipsychotics have different propensities for weight gain, and that children, adolescents, and first-episode patients are at higher risk for weight gain associated with antipsychotic treatment. Monitoring body weight early in treatment will help predict those at high risk for substantial weight gain. Switching antipsychotic medication may or may not be clinically feasible, but can lead to a reduction in body weight. Lifestyle therapies and

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other nonpharmacological interventions have been shown to be effective in controlled clinical trials, but the evidence base for adjunctive medication strategies such as with orlistat, sibutramine, amantadine, nizatidine, metformin, topiramate, and others, is conflicting. At the very least, a "small-steps approach" to managing weight should be offered to all patients who are overweight or obese.

Behavioral weight loss classes for patients with severe mental illness.

Guzik L, Wirshing, D. Department of Psychiatry, Veterans Affairs Greater Los Angeles Healthcare Center, 11301 Wilshire Blvd., Bldg. 210, Los Angeles, CA 90073 lisa.guzik@gmail.com Dr. Wirshing is also an associate clinical professor in the Department of Psychiatry at the University of California, Los Angeles, School of Medicine. Psychiatric Services 2007 Nov; 58(1498)

This is the first paragraph of the article:

There is much skepticism and stigma about whether patients with severe mental illness can participate in, understand, and benefit from a behavioral approach to weight loss. Many fitness programs, even those provided by medical facilities to their outpatient population, exclude patients with severe mental illness. This leaves this population without a source of information or support for weight loss, and obesity is a problem often caused by such psychiatric medications as second-generation antipsychotics. The purpose of our study was to adapt the behavioral weight loss program that was used in the Diabetes Prevention Program for use in a population with mental illness. Our three pilot studies found that patients with severe mental illness not only have the capacity to learn from such programs but also have the commitment to benefit from them.

This is the last paragraph of the article. An abstract of this article is unavailable, and full text of the article can be found at http://psychservices.psychiatryonline.org/cgi/content/full/58/11/1498):

Our patients responded well to consistent positive reinforcement for every step forward. We tempered our expectations to each patient's individual needs and applauded any and all positive change. With this approach, we slowly saw changes in the patients' attitudes, behaviors, and ability to maintain weight loss. A more formal assessment of our behavioral weight loss program is ongoing.

Weight gain in newly diagnosed first-episode psychosis patients and healthy comparisons: one-year analysis.

Strassnig M, Miewald J, Keshavan M, Ganguli R. Western Psychiatric Institute and Clinic, University of Pittsburgh Medical Center, 3811 O'Hara Street, Pittsburgh, PA 15213, United States. Schizophr Res. 2007 Jul;93(1-3):90-8. Epub 2007 May 2.

BACKGROUND: Various antipsychotics are associated with body weight gain. However, most study samples include high proportions of patients with chronic schizophrenia. We examined neuroleptic-induced weight gain in drug-naïve first-episode psychotic patients

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to limit confounding variables such as multiple past medication trials, history of partial adherence; or poor diet and a sedentary lifestyle, associated with chronic mental illness.

METHODS: Newly diagnosed first-episode psychosis patients treated with antipsychotic medication, a small group of patients not receiving antipsychotics, and healthy comparisons were followed for one year. Body weight differences and proportions of subjects with more than 7% weight gain were calculated. The effects of concomitant psychotropic medication on weight gain were explored.

RESULTS: Ninety-eight first-episode psychotics patient and 30 healthy controls were examined. Patients receiving neuroleptics gained significantly more weight than healthy controls (p=0.002). Olanzapine (91% gained >7%) increased body weight by 37.3+/-27.7 lb, followed by risperidone (51%; +16.6+/-22) and haloperidol (47%; +9+/-12), and perphenazine (10%; +3.4+/-6). Younger patients (r=-0.24, p=0.02) and patients with more negative symptoms at baseline (SANS global; r=0.22, p=0.04) gained more weight. A greater number of co-medications per patient, and co-prescription of antidepressants significantly and independently increased antipsychotic-associated weight gain.

DISCUSSION: The results confirm substantial and clinically significant weight gain introduced by antipsychotic treatment in drug-naïve first-episode psychotic patients, and identify several treatment-associated risk factors for weight gain. The magnitude of weight gain induced highlights potential health risks and points to the need for preventive measures such as behavioral weight control programs along with the initiation of pharmacotherapy.

Cigarette smoking and overweight/obesity among individuals with serious mental illnesses: a preventive perspective.

Compton MT, Daumit GL, Druss BG. Department of Psychiatry and Behavioral Sciences, Family and Preventive Medicine, Emory University School of Medicine, Atlanta, 30303 GA, USA. mcompto@emory.edu Harv Rev Psychiatry. 2006 Jul-Aug;14(4):212-22.

BACKGROUND: Cigarette smoking and lifestyle factors underlying overweight/obesity (such as unhealthy diet and physical inactivity) appear to play a major role in the excess medical morbidity and mortality among persons with serious mental illnesses. The literature on the prevalence, etiology, prevention, and treatment of these two risk factors, in the context of serious mental illnesses, are reviewed following a preventive approach.

METHODS: The review relied upon searches of the MEDLINE database, from 1996 through April 2006, restricted to the English language. Original research, review articles, and clinical guidelines relevant to the topics of cigarette smoking, unhealthy diet, physical inactivity, and overweight/obesity among individuals with serious mental illnesses were identified.

RESULTS: Compared to those without a mental illness, individuals with a current mental illness are more than twice as likely to smoke cigarettes and more than 50% more likely to be overweight/obese, presumably the product of unhealthy diet and physical inactivity.

Various biological, iatrogenic, and social factors place psychiatric patients at risk for these and other adverse health behaviors. Studies suggest that many of the same preventive approaches developed for general medical populations are likely to be effective in persons with serious mental disorders, though specialized approaches also are needed. Domains of prevention include primary prevention (population-based strategies to reduce the incidence of these adverse health behaviors), secondary prevention (early detection and treatment), and tertiary prevention (pharmacological and psychosocial treatments to reduce the burden of illness among those with the behaviors in question). However, mental health clinicians commonly lack the training or expertise to provide these services.

CONCLUSIONS: The high prevalence, adverse effects, and efficaciousness of treatments for smoking and obesity in persons with serious mental illnesses suggest the importance of addressing these problems in this population. Both further research and dissemination efforts are needed to ensure that patients with serious mental illnesses receive the appropriate preventive and clinical services for these two adverse health conditions.

A psychiatric rehabilitation approach to weight loss.

Brown C, Goetz J, Van Sciver A, Sullivan D, Hamera E. University of Kansas Medical Center, Occupational Therapy Education, Kansas City 66160, USA. Psychiatr Rehabil J. 2006 Spring;29(4):267-73.

Obesity is a major problem nationwide and even more prevalent among people with psychiatric disabilities. This study examined the efficacy of a psychiatric rehabilitation weight loss program. Twenty-one individuals participated in the 12-week intervention. Another 15 individuals served as matched controls. Results indicate the intervention group improved more than the control group for weight, body mass index, waist circumference and physical activity. The intervention group lost 2.7 kg (6 lbs) and the control group gained 0.5 kg (1 lb). A weight loss program incorporating psychiatric rehabilitation principles was effective for people with psychiatric disabilities at a community based program.

The role of a fitness intervention on people with serious psychiatric disabilities.

Skrinar GS, Huxley NA, Hutchinson DS, Menninger E, Glew P. Department of Health Sciences, Sargent College of Health & Rehabilitation Sciences, Boston University, MA 02215, USA. Psychiatr Rehabil J. 2005 Fall;29(2):122-7.

The purpose of this study was to determine the effects a health education and exercise program would have in limiting weight gain and in improving fitness and psychological parameters in adults with mood or psychotic disorders. Thirty volunteers were randomly assigned to the healthy lifestyle group (HL) or a control group. The HL group engaged in exercise for 12 weeks. Pre- and post-exercise testing was conducted to assess body fat, lipid profile, and cardiovascular fitness. Educational seminars were held weekly. The intervention group evidenced greater weight loss than the control group, although not statistically significant. Significant differences were observed in ratings of general health

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($p < .05$) and empowerment ($p < .01$). Trends suggest that exercise interventions may encourage weight loss, particularly if barriers to full participation can be addressed. Additionally, such interventions may contribute to "perceived" well-being even among those with subclinical participation.

Increasing lifestyle physical activity in patients with depression or other serious mental illness.

Richardson CR, Avripas SA, Neal DL, Marcus SM. University of Michigan Medical School, Ann Arbor, MI 48109, USA. J Psychiatr Pract. 2005 Nov;11(6):379-88.

People with severe and persistent mental illness are more likely to be overweight and to suffer from obesity-related illnesses such as diabetes and heart disease than healthy individuals. Lifestyle change interventions that emphasize integrating physical activity into daily life have not been studied extensively in people with mental illness. The authors present the results of an initial feasibility study of a lifestyle modification program for individuals with serious mental illness. Thirty-nine individuals with depression or other serious mental illness were recruited from three different mental health facilities to attend an 18-week lifestyle intervention program promoting physical activity and healthy eating. At each session, participants discussed topics related to healthy lifestyle changes and participated in group walks. Data were collected at baseline, 6 weeks, and 18 weeks. The results demonstrated that individuals who have depression and other serious mental illnesses can participate in a lifestyle intervention program. Participants who attended the final follow-up session had lost weight over the course of the intervention. Study retention was a problem. However, the cost of this type of group-based lifestyle intervention was relatively low, so that such an intervention for this high-risk group may still be cost-effective.

A study of a structured exercise program with members of an ICCD Certified Clubhouse: program design, benefits, and implications for feasibility.

Pelletier JR, Nguyen M, Bradley K, Johnsen M, McKay C. Institute for Social and Rehabilitation Services, Assumption College, Worcester, MA 01609, USA. jpelleti@assumption.edu Psychiatr Rehabil J. 2005 Fall;29(2):89-96.

Individuals with serious mental illness (SMI) have significantly greater risk of comorbid health problems and premature death, and there is need for interventions that can improve physical fitness and overall health. Accordingly, a study was conducted which evaluated the effectiveness of a structured physical exercise program that was developed as part of a wellness project in an ICCD Certified Clubhouse. Seventeen clubhouse members completed a 16-week program with evidence of significant improvement in aerobic capacity and perceived mental health as well as positive trends in perceived improvements in physical and social functioning. Qualitative data indicated satisfaction with the program by all participants, especially the value of group support, while also highlighting the need for greater attention to nutrition as part of a future program. Moreover, the study found that a structured exercise program can be successfully provided to members of an ICCD Certified Clubhouse.

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Behavioral treatment of obesity in patients taking antipsychotic medications.

Kalarchian MA, Marcus MD, Levine MD, Haas GL, Greeno CG, Weissfeld LA, Qin L. Western Psychiatric Institute and Clinic, University of Pittsburgh Medical Center, Pittsburgh, PA 15213, USA. kalarchianma@msx.upmc.edu J Clin Psychiatry. 2005 Aug;66(8):1058-63.

OBJECTIVE: Antipsychotic medications are associated with weight gain and metabolic dysregulation, yet little is known about the management of obesity among individuals with severe and persistent mental illness. Thus we sought to evaluate the potential utility of a behavioral weight control program for this population.

METHOD: Outpatients receiving psychiatric care at a university medical center who had a body mass index (BMI; weight in kg/[height in m](2)) >or= 30 and were currently taking antipsychotic medication participated in a 12-week group behavioral weight control program. A medical chart review was conducted for each participant's body weight over the 10 months prior to beginning the program. A multiple baseline design was used to determine the impact of the intervention on BMI through 12-month posttreatment follow-up. We also assessed self-reported eating behavior, physical activity, and health-related quality of life. Data were collected from October 2000 to July 2003.

RESULTS: Among 35 patients who began the program, 29 (83%) completed treatment, with mean (+/- SD) weight loss of 5.04 (+/- 7.52) pounds (p = .001) and improvements in eating, activity, and quality of life. At 3-month posttreatment follow-up (N = 27; 77%), total mean weight loss was 7.14 (+/- 11.47) pounds (p = .003). Results of a longitudinal model based on general estimating equations indicated that, relative to the pretreatment period, BMI decreased significantly during treatment and remained stable through 12-month posttreatment follow-up.

CONCLUSION: Behavioral weight control is a promising approach to the treatment of obesity among outpatients taking antipsychotic medications, but longer and more robust interventions are needed.

MULTIPLE SCLEROSIS, VETERANS WITH

The prevalence of overweight and obesity in veterans with multiple sclerosis.

Khurana SR, Bamer AM, Turner AP, Wadhwani RV, Bowen JD, Leipertz SL, Haselkorn JK. Department of Rehabilitation Medicine, University of Miami, Coral Gables, Florida, USA. Am J Phys Med Rehabil. 2009 Feb;88(2):83-91.

OBJECTIVES: To estimate the prevalence and factors associated with overweight and obesity in veterans with multiple sclerosis (MS) enrolled in the Veterans Health Administration (VA) and to compare the prevalence in this group with gender-specific

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published rates for the general population of veterans receiving outpatient care at VA medical facilities.

DESIGN: Cross-sectional cohort study linking electronic medical record information to mailed survey from 1999 to 2004. A total of 4703 veterans with MS enrolled in VA who returned questionnaires as part of two cross-sectional studies. Main outcome measures included body mass index, demographic information, Veteran RAND 36-item Health Survey, frequency of physical exercise, and other health conditions.

RESULTS: Overall, 28% of female and 42.8% of male veterans with MS were overweight. Another 25% of women and 21.2% of male veterans met the criteria for obesity. Compared with a historical cohort of veterans enrolled in the VA, veterans with MS had a slightly higher adjusted prevalence of overweight than did veterans in general (42.3% vs. 39.6%, respectively) but a lower adjusted prevalence of obesity (20.1% vs. 33.1%). In adjusted logistic regression, age, smoking, and lower levels of pain were associated with a lower likelihood of overweight or obesity. Being male, married, employed and having arthritis and diabetes were associated with a greater likelihood of overweight or obesity.

CONCLUSIONS: Overweight and obesity are a problem for more than 60% of veterans with MS in the VA. Screening for overweight and obesity should be done routinely. Interventions to prevent and manage excessive weight in individuals with MS should be developed and evaluated.

SPINAL CORD INJURY

Greater daily leisure time physical activity is associated with lower chronic disease risk in adults with spinal cord injury.

Buchholz AC, Martin Ginis KA, Bray SR, Craven BC, Hicks AL, Hayes KC, Latimer AE, McColl MA, Potter PJ, Wolfe DL. Department of Family Relations and Applied Human Nutrition, University of Guelph, Guelph, ON N1G 2W1, Canada. abuchhol@uoguelph.ca Appl Physiol Nutr Metab. 2009 Aug;34(4):640-7.

The objective of this study was to examine the relationship between leisure time physical activity (LTPA) and common risk factors for cardiovascular disease (CVD) and type 2 diabetes in community-dwelling adults with chronic spinal cord injury (SCI). LTPA was measured using the Physical Activity Recall Assessment for People with SCI in 76 men and women with chronic (> or =1 year) paraplegia or tetraplegia, living in or near Hamilton, Ontario. Body mass index (BMI), waist circumference, body composition (fat mass (FM) and fat-free mass (FFM)), blood pressure, and biochemical data were collected. Thirty-seven percent (n = 28 participants) were inactive, reporting no LTPA whatsoever, and were compared with an equal-sized group consisting of the most active study participants (> or =25 min of LTPA per day). After adjusting for significant covariates, BMI (18.7%), %FM (19.4%), and C-reactive protein (143%) were all lower, and %FFM was higher (7.2%), in active participants (all p < or = 0.05). Ten percent of

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active participants vs. 33% of inactive participants were insulin resistant (p = 0.03). Waist circumference (17.6%) and systolic blood pressure (15.3%) were lower in active vs. inactive participants with paraplegia (both p < or = 0.05), but not tetraplegia. In conclusion, greater daily LTPA is associated with lower levels of selected CVD and type 2 diabetes risk factors in individuals living with SCI. Whether this relationship translates into a lower incidence of these chronic diseases has yet to be determined.

Clinical assessment and management of obesity in individuals with spinal cord injury: a review.

Rajan S, McNeely MJ, Warms C, Goldstein B. VA Puget Sound Health Care System, Seattle, Washington, USA. suparna.rajan@va.gov J Spinal Cord Med. 2008;31(4):361-72.

BACKGROUND: Diagnosing and managing obesity in individuals with spinal cord injury (SCI) remain challenging.

METHODS: Literature on the epidemiology, impact, and management of obesity in individuals with SCI was reviewed.

FINDINGS: Although nearly 66% of individuals with SCI are either overweight or obese, little guidance is available to measure and monitor obesity in the clinical setting. The use of anthropometric indices and specific cut points available for able-bodied persons is limited by the body composition changes that follow SCI. Indices of upper body obesity warrant examination in SCI because they provide an index of central obesity, which is more closely linked to some obesity-related conditions than is overall obesity. Investigations into the sequelae of excess body fat and its distribution are also needed in SCI because past research in this area has been inconclusive. Although limited, evidence regarding obesity interventions in SCI may be promising.

CONCLUSIONS: The best anthropometric tool to define obesity in the clinical setting remains unknown. SCI-specific assessment tools and a better understanding of the sequelae of excess body weight will lead to better targeting of prevention and treatment efforts. More research is needed on the individual components of a weight management program unique to SCI. Until then, providers are urged to use a team approach and draw on existing resources and applicable research in able-bodied individuals to facilitate weight management in individuals with SCI.

Obesity after spinal cord injury.

Gater DR Jr. Spinal Cord Injury and Disorders Center, Hunter Holmes McGuire VAMC (652/128), 1201 Broad Rock Boulevard, Richmond, VA 23249, USA. David.Gater@va.gov Phys Med Rehabil Clin N Am. 2007 May;18(2):333-51, vii.

America is in the midst of an obesity epidemic, and individuals who have spinal cord injury (SCI) are perhaps at greater risk than any other segment of the population. Recent changes in the way obesity has been defined have lulled SCI practitioners into a false sense of security about the health of their patients regarding the dangers of obesity and

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its sequelae. This article defines and uses a definition of obesity that is more relevant to persons who have SCI, reviews the physiology of adipose tissue, and discusses aspects of heredity and environment that contribute to obesity in SCI. The pathophysiology of obesity is discussed relative to health risks for persons who have SCI, particularly those contributing to cardiovascular disease. Prevalence of obesity and its comorbidities are discussed and management options reviewed.

Obesity intervention in persons with spinal cord injury.

Chen Y, Henson S, Jackson AB, Richards JS. Department of Physical Medicine and Rehabilitation, University of Alabama at Birmingham, Birmingham, AL 35249, USA. Spinal Cord. 2006 Feb;44(2):82-91.

STUDY DESIGN: A single group uncontrolled trial.

OBJECTIVES: Despite widespread emphasis on the obesity-related health risks in persons with spinal cord injury (SCI), limited research has been carried out to intervene in this problem. This study was conducted to assess the initial effectiveness of a weight loss program on various health outcomes in persons with SCI.

SETTING: A rehabilitation center in Birmingham, Alabama, United States.

METHODS: A total of 16 individuals with chronic SCI who were overweight or obese participated in a weight management program that consisted of 12 weekly classes, covering nutrition, exercise, and behavior modification. Various outcomes were examined over a 6-month period (baseline, week 12, and week 24), including body composition measured by dual energy X-ray absorptiometry, physiologic measures, diet behavior, and psychosocial and physical functioning. Of these, 13 participants returned for the week 24 follow-up.

RESULTS: Weight loss averaged 3.5+/-3.1 kg (3.8% of the initial weight) at week 12 and 2.9+/-3.7 kg (3.0% of the initial weight) at week 24. There was a significant reduction from baseline values at weeks 12 and 24 in body mass index, anthropometric measurements, and fat mass and improvement in diet behavior and psychosocial and physical functioning, while lean mass and blood albumin and hemoglobin levels were maintained. A correlation analysis showed that a greater weight loss was importantly ($r>0.4$) associated with a greater reduction in total cholesterol at weeks 12 and 24 and in systolic and diastolic blood pressure at week 24. Several factors were important ($r>0.4$ or $r<-0.4$) in determining the success in weight loss, including age, race, marital and employment status, family history of overweight/obesity, level and duration of injury, and cholesterol level at baseline.

CONCLUSIONS: This is the first demonstration that a carefully planned program with time-calorie displacement diet is effective for overweight/obese individuals with SCI to lose weight without compromising total lean mass and overall health. It provides foundation for a future large clinical trial for weight loss of persons with SCI or other spinal cord dysfunction.

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Body mass index in spinal cord injury -- a retrospective study.

Gupta N, White KT, Sandford PR. Department of Physical Medicine and Rehabilitation, Clement J Zablocki VA Medical Center, Medical College of Wisconsin, Milwaukee, WI 53295, USA. Spinal Cord. 2006 Feb;44(2):92-4.

STUDY DESIGN: Retrospective chart review.

OBJECTIVE: To identify the prevalence of overweight and severely overweight (obese) in veterans with spinal cord injury.

SETTING: Veterans Administration Hospital in Wisconsin.

METHODS: A retrospective chart review of all the patients registered in the current database with the Spinal Cord Injury Unit in the Veterans Administration Hospital was undertaken Data collected for each patient included age, sex, height, date of assessment of the height, weight, date of assessment of the weight, duration of spinal cord injury and the type of spinal cord injury -- paraplegia versus quadriplegia. The body mass index (BMI) was subsequently calculated for each patient and the prevalence of overweight and obesity were determined.

RESULTS: There were a total of 408 patients registered in the database with the Spinal Injury Unit. The median age was 56 years, and the mean age 55.8 years. Of all patients with spinal cord injury, 52.2% patients had paraplegia and 47.7% had quadriplegia. The mean duration of injury was 19 years. Of the total number of patients, 46.0% were ASIA A, 11.0% were ASIA B, 12.7% were ASIA C and 29.1% were ASIA D. In all, 27.9% patients had a normal BMI and 3.6% patients were undernourished (BMI less than 18.5 kg/m(2)). The prevalence of overweight was 65.8% and 29.9% patients were obese.

CONCLUSION: Overweight and obesity are problems of a significant magnitude in veterans with spinal cord injury.

SPINAL CORD INJURY IN CHILDREN AND ADOLESCENTS

Impact of spinal cord dysfunction and obesity on the health-related quality of life of children and adolescents.

Abresch RT, McDonald DA, Widman LM, McGinnis K, Hickey KJ. University of California Davis School of Medicine, Davis, California 95616, USA. tabresch@ucdavis.edu J Spinal Cord Med. 2007;30 Suppl 1:S112-8.

OBJECTIVES: The objectives of this study were: (1) to compare the health-related quality of life (HRQOL) of children and adolescents with mobility impairments due to spinal cord injury (SCI) and spina bifida (SB) to the HRQOL of children and adolescent controls without mobility impairments (CTRL); and (2) to examine the impact of of obesity on the HRQOL of these subjects.

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METHODS: The Pediatric Quality of Life Inventory (PedsQL) was administered to 42 SB, 71 SCI and 60 able-bodied subjects who were 8-20 years of age. Subjects were categorized as obese if their BMI exceeded the 95th percentile for age. Twenty-one CTRL, 26 SB and 26 SCI subjects were obese.

RESULTS: The SCI and SB subjects had significantly lower subscores than the control subjects on the physical ($p < 0.001$), emotional ($p < .01$), social ($p < .001$), and school ($p < .001$) domains of the PedsQL. The obese (CTRL) group had lower subscores on the physical ($p < 0.001$), social ($p < 0.001$), and psychosocial ($p < 0.001$) domains of the PedsQL as compared to the non-obese CTRL group, while there were no significant differences in subscores from the emotional and school domains. In contrast to the subjects without mobility impairment, there were no significant differences between the sub-scores of the obese and non-obese subjects with spinal cord dysfunction secondary to SCI or SB. The mean total PedsQL score of the non-obese control group (87.7 +/- 2.1) was significantly higher than the obese control group (75.2 +/- 3.4, $p < 0.02$), which in turn was significantly higher than the SCI group (63.7 +/- 2.2, $p < 0.02$), and the SB group (63.0 +/- 2.2, $p < 0.02$).

CONCLUSION: Patients with SCI and SB have significantly lower HRQOL than children and adolescents without mobility impairments. Whereas obesity significantly reduces the quality of life scores of adolescents without mobility impairments, it has no significant incremental effect on subjects with SCI or SB.

Behavioral intervention, exercise, and nutrition education to improve health and fitness (BENEfit) in adolescents with mobility impairment due to spinal cord dysfunction.

Liusuwan RA, Widman LM, Abresch RT, Johnson AJ, McDonald CM. Shriners Hospitals for Children Northern California, Sacramento, California, USA. J Spinal Cord Med. 2007;30 Suppl 1:S119-26.

BACKGROUND/OBJECTIVE: Determine the effects of a nutrition education and exercise intervention on the health and fitness of adolescents with mobility impairment due to spinal cord dysfunction from myelomeningocele and spinal cord injury. Subjects participated in a 16-week intervention consisting of a behavioral approach to lifestyle change, exercise, and nutrition education to improve fitness (BENEfit) program. Participants were given a schedule of aerobic and strengthening exercises and attended nutrition education and behavior modification sessions every other week along with their parent(s).

SUBJECTS: Twenty adolescents (aged 11-18 years, mean 15.4 +/- 2.2 years) with spinal cord dysfunction.

METHODS: Subjects were tested immediately prior to starting and upon completion of the program. Aerobic fitness was measured using a ramp protocol with an arm ergometer. Heart rate and oxygen uptake were measured. Values at anaerobic threshold and maximum oxygen uptake were recorded. Peak isokinetic arm and shoulder strength

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were determined with a dynamometer. Body composition was estimated with dual-energy x-ray absorptiometry. Serum chemistry included measures of cholesterol, high-density lipoprotein, low-density lipoprotein, and triglycerides.

RESULTS: Fourteen individuals completed all testing sessions. There was no significant overall change in weight, body mass index, body mass index z-scores, or serum chemistry. Overall, there was a significant increase in whole body lean tissue without a concomitant increase in whole body fat. Fitness measures revealed a significant increase in maximum power output, work efficiency as measured by the amount of power output produced aerobically, and resting oxygen uptake. Strength measurements revealed a significant increase in shoulder extension strength and a trend towards increased shoulder flexion strength. There were no significant changes in high-density lipoprotein, low-density lipoprotein, total cholesterol, or triglycerides.

CONCLUSIONS: The BENEfit program shows promise as a method for improving the health and fitness of adolescents with mobility impairments who are at high risk for obesity and obesity-related health conditions.

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