The Need for Health Promotion for Adults Who Are Visually Impaired

Michele Capella-McDonnall

Abstract: Health promotion interventions for adults who are visually impaired have received little attention. This article reports what is currently known about the health, overweight and obesity, and levels of physical activity reported by these adults. Conclusions about the need for health promotion activities based on this information are provided, and suggestions for implementing these activities or interventions are offered.

Adults who are visually impaired (that is, those who are blind or have low vision) are substantially more likely to report poor, fair, or worsening health than are adults who are sighted (Capella-McDonnall, 2005; Tielsch, Sommer, Katz, Quigley, & Ezrine, 1991; Wang, Mitchell, & Smith, 2000). Two conditions that may contribute to this reported inferior health are being overweight or obese and not being physically active. In this article, I first present a literature review on the problems of overweight and obesity and the lack of physical activity in the general population and what is known in these areas that specifically addressed persons with disabilities, including persons who are visually impaired. I then report on past interventions and the new focus on health promotion for persons with disabilities. Finally, I discuss ways in which health promotion activities or interventions can be implemented with adults who are blind or have low vision. In this article, I use the International Classification of Functioning, Disability, and Health (ICF; World Health Organization, WHO, 2001) as a conceptual framework to help explain the need for health promotion activities with adults who are visually impaired and present the potential outcomes of such activities.

The problems

The overweight and obesity epidemic

The incidence of overweight and obesity has increased at an alarming rate in recent years in the United States, as well as throughout the world. The rate of increase has been so significant that this is now considered one of the most important public health problems of our time (Simons-Morton, Obarzanek, & Cutler, 2006). The body mass index (BMI), which is measured as a person's weight in kilograms divided by a person's height in meters squared, is traditionally used to determine overweight (BMI equal to or greater than 25) and obesity (BMI equal to or greater than 30). The prevalence of obesity among adults in the United States remained relatively stable at approximately 13%–15% from 1960 to 1974, but increased substantially to 22.9% from 1988 to 1994 and increased significantly again to 30.4% from 1999 to 2002 (Flegal,

Carroll, Ogden, & Johnson, 2002; Hedley et al., 2004). An additional 34.7% of the U.S. population was overweight from 1999 to 2002, bringing the total percentage of the population who are overweight or obese to 65.1% (Hedley et al., 2004)—a significant increase over the 55.9% reported from 1988 to 1994 (Flegal et al., 2002). Data from the Framingham Heart Study, a community-based prospective cohort study, indicate that the long-term estimated risks for overweight and obesity in the population are extremely high, with more than 8 in 10 Americans expected to be overweight and 1 in 2 expected to be obese (Vasan, Pencina, Cobain, Freiberg, & D'Agostino, 2005).

There is considerable evidence that the rates of overweight and obesity are higher among persons with disabilities than among the general population. In a study that used data from the 1998 and 1999 Behavioral Risk Factor Surveillance System for eight states and the District of Columbia, the Centers for Disease Control and Prevention (CDC, 2002) reported that persons with disabilities had substantially higher rates of obesity than did those without disabilities (27.4% versus 16.5%). Using data from the 1994–95 National Health Interview Survey, Weil et al. (2002) also found that persons with disabilities were significantly more likely to be obese than were persons without disabilities. They included analyses by disability group; the odds of being obese for persons with blindness or low vision were 1.5 times greater than for the general population. Rimmer and Wang (2005), using data from a sample of 306 persons with disabilities that included measured height and weight, provided evidence that persons with disabilities have substantially higher rates of overweight, obesity, and extreme obesity than do those in the general population.

Overweight and obesity are a major public health concern because they are associated with a multitude of medical conditions and negative psychosocial outcomes, as well as increased mortality. Medical conditions that have consistently been linked to overweight and obesity include type 2 diabetes; heart disease; high blood pressure; stroke; certain types of cancer, such as cancer of the colon, prostate, breast, and uterus; osteoarthritis; pulmonary problems, including asthma and sleep apnea; liver disease; gallbladder disease and gallstones; and dyslipidemia (high cholesterol levels) (CDC, 2005b; U.S. Department of Health & Human Services, USDHHS, 2001; 2004). In addition, overweight and obesity have been associated with a greater risk of eye diseases or a faster progression of certain eye diseases such as macular degeneration, maculopathy, cataracts, glaucoma, and diabetic retinopathy (Glynn, Christen, Manson, Bernheimer, & Hennekens, 1995; Habot-Wilner & Belkin, 2005; Klein, Klein, Lee, & Jensen, 2001; Seddon, Cote, Davis, & Rosner, 2003). There are also negative psychological and social effects related to being obese (Kolotkin, Meter, & Williams, 2001; USDHHS, 2001), since obesity is stigmatized in this society, even by people who are overweight or obese (Friedman et al., 2005; Latner, Stunkard, & Wilson, 2005).

The combined direct and indirect costs of obesity in the United States were estimated to be $117 billion in 2000 (USDHHS, 2001). Medical spending related to overweight and obesity was estimated to account for 9.1% of the total U.S. medical expenditures in 1998, rival-

ing medical spending associated with smoking (Finkelstein, Fiebelkorn, & Wang, 2003). There is substantial evidence that losing weight is effective in reducing the health risks associated with overweight and obesity (NHLBI Obesity Education Initiative, 1998), as well as the associated medical costs (Oster, Thompson, Edelsberg, Bird, & Colditz, 1999).

Lack of physical activity

Another major problem, and one that is linked to the obesity epidemic, is the lack of physical activity of Americans (CDC, 2005a). Physical activity is known to promote psychological well-being and to build and maintain healthy bones, muscles, and joints (USDHHS, 2002). Physical inactivity has been associated with several medical conditions, specifically cardiovascular disease, high blood pressure, colon and breast cancer, type 2 diabetes, osteoarthritis, osteoporosis, and depression (USDHHS, 1996; 2002). The lack of physical activity can result in an increase in functional decline and a greater occurrence of secondary conditions among persons with disabilities (Dunlop et al., 2005; Rimmer, 1999; USDHHS, 2000). The U.S. Department of Agriculture's (2005) dietary guidelines include three recommendations for amounts of physical activity, depending on the goal. To reduce the risk of chronic disease, at least 30 minutes of moderately intense activity on most days of the week are necessary, with the recommendation that greater health benefits can be obtained by engaging in activities that are more intense or of longer duration. To manage body weight and prevent weight gain, 60 minutes of moderately to vigorously intense activity on most days of the week are recommended. To sustain weight loss, at least 60 to 90 minutes of daily moderately intense activity are advised. Most Americans do not engage in even the minimum recommended amount of physical activity (CDC, 2005a).

The lack of physical activity is known to be a greater problem among persons with disabilities (USDHHS, 2000)—a problem that has received attention from researchers in the field of visual impairment for many years, primarily with a focus on children and adolescents. It has been well documented that persons who are visually impaired are less physically active and in poorer physical condition than are sighted persons (Hopkins, Gaeta, Thomas, & Hill, 1987; Kobberling, Jankowski, & Leger, 1991; Kozub & Oh, 2004; Lieberman & McHugh, 2001; Longmuir & Bar-Or, 2000; Short & Winnick, 1986; Skaggs & Hopper, 1996). Compared to children and adolescents in other disability groups, those who are visually impaired, along with those with physical disabilities, are the most inactive, with 39% classified as sedentary and only 27% classified as active (Longmuir & Bar-Or, 2000). Furthermore, older children and adolescents who are visually impaired are less physically active than are their younger counterparts (Ayvazoglu, Oh, & Kozub, 2006; Oh, Ozturk, & Kozub, 2004).

Although virtually all the studies in this area have been conducted with children and adolescents, it seems safe to assume that these trends continue into adulthood, given the lack of access to recreational and athletic programs that adults who are visually impaired often experience (Ponchillia, 1995), the lack of help or encouragement they receive in developing physical recreation skills or habits (Sherrill, Rainbolt, & Ervin, 1984), and the real and perceived barriers to exercise that they and

other persons with disabilities experience (Rimmer, Rubin, & Braddock, 2000; Rimmer, Rubin, Braddock, & Hedman, 1999; Stuart, Lieberman, & Hand, 2006; USDHHS, 2000). Twenty years ago, Hanna (1986) stressed the need to develop strategies that enhance the physical fitness of persons who are visually impaired; today, it seems that little has changed in this area and that less attention is being afforded to it in the literature.

Conceptual framework

ICF (WHO, 2001) can be used as a conceptual framework to define the population of interest, explain their need for health promotion activities, and describe potential outcomes for these activities. ICF is a multipurpose classification system of health and health-related domains that are classified from the body, individual, and societal perspectives via two lists: body functions and structures, and activities and participation. It also takes contextual factors that interact with these components into consideration (WHO, 2002). Contextual factors consist of two components: environmental factors, which are classified in the system, and personal factors, which are not classified in the system. ICF is based on the biopsychosocial model, which is an integration of the medical and social models of disability, and represents a paradigm shift from an emphasis on disability to a focus on functioning and health.

The population can be defined as persons who experience an impairment in seeing, which is classified as a body function in ICF (b210). This impairment could include difficulty in one or more of the following classified areas: visual acuity function; visual field function; quality of vision; or visual functions, other specified or unspecified. Specific etiologies that may cause an impairment in seeing include diabetic retinopathy, retinitis pigmentosa, glaucoma, cataracts, macular degeneration, and trauma. This population has traditionally been referred to as persons who are blind or have low vision or persons with visual impairments, whereas the terms used in ICF are "persons with impairments in seeing" or "persons with sight impairments." The ICF terms are used in this section.

As a result of a body-function impairment in seeing, persons may experience activity limitations or participation restrictions in several areas that are described in ICF. Some of these areas are related directly to the sight impairment, such as watching (d110), receiving communication via nonverbal or written messages (d315 or d325), and driving (d475), and some are indirectly associated with the impairment, like walking (d450), managing diet and fitness (d5701), preparing meals (d630), shopping (d6200), engaging in community life (d910), and participating in recreational and leisure activities (d920). In addition, persons with sight impairments may experience environmental barriers in such ICF areas as attitudes of individuals and the society (e425, e445, e450, e455, e460); communication services, systems, and policies (e535); and transportation services, systems, and policies (e540).

The activity limitations and participation restrictions and associated environmental barriers that are caused by an impairment in seeing can contribute to problems with overweight and obesity. For example, difficulty preparing meals limits the breadth of food options that are

available to a person, often resulting in the consumption of a greater amount of "convenience foods," which tend to be higher in fat and calories. Persons who cannot read the small print on nutrition labels may have difficulty obtaining information about the nutritional content of foods, which makes it more challenging for them to make good food choices. The difficulty in getting to a grocery store independently may limit the frequency of shopping, making it less viable to buy healthier, fresh foods and encouraging the consumption of more prepared, convenience foods. Activity limitations in walking and environmental barriers, such as transportation and the lack of accessible exercise equipment, can hamper a person's ability to be physically active, which is a key component to maintaining a healthy weight.

Past interventions and support for their importance

Overweight and obesity

The large and rapidly increasing number of Americans who are overweight or obese and the risk factors that are associated with these conditions, along with the knowledge that losing weight can reduce associated morbidity, underscore the importance of interventions to address this problem. A substantial number of interventions have been reported in the literature, and several major reviews and evaluations of interventions have been conducted (Jain, 2004; McTigue et al., 2003; NHLBI Obesity Education Initiative, 1998). According to these reviews, lifestyle interventions, which include changes in diet and physical activity and behavioral therapy, are the most popular. They have been shown to promote modest weight loss in participants. Specific components of lifestyle interventions that have been found to be associated with greater or more sustained weight loss are the combination of dietary changes, increased physical activity, and behavioral therapy; longer-term and higher-intensity (more frequent) interventions; and maintenance strategies. I found no obesity interventions that specifically related to adults with visual impairments in the literature.

Physical activity

Although there is evidence that persons who are visually impaired are less physically active and in poorer physical condition than are sighted persons, little seems to have been done to address the problem. I found only two interventions that specifically addressed increasing the physical activity of adults with visual impairments in the literature. One was a walking program for older adults who were attending a rehabilitation center (Weitzman, 1985), and the other involved instruction in aerobic exercises for adults who were totally blind in a mainstream aerobics class (Ponchillia, Powell, Felski, & Nicklawski, 1992). Although both involved small samples (14 and 3, respectively), they offered some evidence that adults who are visually impaired can learn and perform traditional exercises, given the opportunity for involvement. Physical activity interventions for children with visual impairments, specifically summer sports camps, seem to be more common than are interventions for adults (Ponchillia, Armbruster, & Wiebold, 2005; Shapiro, Moffett, Lieberman, & Dummer, 2005).

Health promotion for persons with disabilities

Persons with disabilities, including those who are visually impaired, are more likely to report poorer health than are persons without disabilities (Horowitz, Brennan, & Reinhardt, 2005; Jacobs, Hammerman-Rozenberg, Maaravi, Cohen, & Stessman, 2005; Rimmer, 1999; Wang et al., 2000). Health promotion for persons with disabilities has been a national priority in recent years (Rimmer & Braddock, 2002; USDHHS, 2000). The notion that health can coexist with disability has gained acceptance, and the importance of maximizing the health of persons with disabilities has been established. In 2005, the Surgeon General of the United States called for action to improve the health and wellness of persons with disabilities (USDHHS, 2005).

Although hundreds, if not thousands, of interventions related to the promotion of health (including weight loss and physical activity) for the general population have been reported in the literature, interventions that are specifically related to persons with disabilities have been limited. Recently, more research attention has been focused on this population. The interventions reported have traditionally focused on specific disability groups. For example, interventions have been reported for persons with multiple sclerosis (Petajan et al., 1996; Stuifbergen, Becker, Blozis, Timmerman, & Kullberg, 2003), physical disabilities or mobility impairments (Chen, Henson, Jackson, & Richards, 2006; Hughes, Nosek, Howland, Groff, & Mullen, 2003; Ravesloot, Seekins, & White, 2005), osteoarthritis (Ettinger et al., 1997; Messier et al., 2004), intellectual disabilities (Marshall, McConkey, & Moore, 2003), and survivors of stroke (Rimmer et al., 2000). However, as was mentioned previously, health promotion interventions for adults who are visually impaired have been limited.

Governmental support for importance of health promotion

The problems of lower levels of physical activity and the greater likelihood of obesity among persons with disabilities began to receive national attention with *Healthy People 2010* (*HP2010*; USDHHS, 2000), this country's comprehensive health promotion and disease-prevention agenda. *HP2010* includes two overarching goals and hundreds of focus-area goals for the nation to meet by 2010. Health-promotion activities or interventions can address both overarching goals of *HP2010:* to increase the quality and years of healthy life and to eliminate health disparities among different segments of the population.

Health promotion activities and interventions for persons who are visually impaired can specifically address *HP2010*'s priority area of disparities in health among people with disabilities, along with goals in other focus areas. For example, in the area of educational and community-based programs, *HP2010* calls for an increase in the quality, availability, and effectiveness of community-based health promotion programs. In addition, it emphasizes the importance of tailoring effective programs to individual considerations, such as disability status. One gap in the research identified by this focus area is the lack of appropriate approaches for disadvantaged and special populations, such as persons with disabilities. Such activities or interventions should also directly address the overall goals under the focus areas of

nutrition and overweight—"to promote health and reduce chronic disease associated with diet and weight" (p. 19-3)—and physical activity and fitness—"to improve health, fitness, and quality of life through daily physical activity" (p. 22-3).

Addressing the problems with adults who are visually impaired

With the substantial evidence of the poorer health, lack of physical activity, and higher levels of overweight and obesity among adults who are visually impaired, it is clear that these adults need health promotion activities. However, how such activities or interventions can be implemented needs to be considered. Using the ICF framework, I present potential outcomes for these interventions first, followed by several options for implementation.

Conceptual framework: Targeting outcomes

Health promotion activities or interventions may target improvements in several areas covered by ICF, including activity limitations, participation restrictions, and personal factors of individual participants. The primary activity limitations and participation restrictions that could be ameliorated by a health promotion intervention are managing diet and fitness (d5701), participating in recreational and leisure activities (d920), and engaging in community life (d910). Under the area of personal factors, health promotion activities or interventions can have a positive impact on other health conditions, fitness and lifestyle habits, self-efficacy, and health-related quality of life. In the area of environmental factors, interventions may focus on facilitating transportation services (e5400) for participants and support by others, such as family members (e310 or e315), friends (e320), members of the community (e325), and professionals (e355), for achieving a health lifestyle.

Options for implementation

Rehabilitation setting

One option for implementing health promotion interventions with people who are visually impaired is in a rehabilitation setting. If rehabilitation consumers need assistance with losing weight, becoming more physically active, and maintaining a healthy lifestyle, a rehabilitation setting would provide an excellent avenue to provide this assistance. An intervention in such a setting should include the opportunity for consumers to: (a) learn about different physical activity options and try several of them, (b) receive information about healthy eating habits, (c) receive information about nutritional issues specific to persons with blindness or low vision, (d) learn about healthy cooking and (e) prepare healthy meals. Consumers would be given the opportunity to try out different exercise options in the community, such as at local health clubs or wellness centers, public swimming pools, and tracks. One objective of the intervention would be to familiarize consumers with these places, so they would feel comfortable continuing to use them once the intervention was over. Furthermore, consumers would be introduced to various national recreational sports organizations for people with visual impairments, including those for bowling, golf, skiing, beep baseball, goalball, tandem biking, sailing, and bodybuilding. These organizations may provide them with additional

opportunities for physical activity in their local communities.

Exposure to the topics and activities included in the intervention early in the rehabilitation process may help prevent the inactivity and weight gain that is often associated with visual impairment. Essential messages for consumers to hear are the importance of remaining (or becoming) physically active despite visual impairment, and the importance of a healthy diet in maintaining an appropriate weight. The intervention would provide consumers with the appropriate knowledge, experiences, and skills that are necessary to maintain a healthy lifestyle. Actually practicing healthy lifestyle habits after the conclusion of the intervention would be up to the consumer; the goal of the intervention would be to empower consumers and provide them with the tools necessary to do this.

Specific rehabilitation settings in which this intervention could be implemented are residential rehabilitation facilities and vocational rehabilitation agencies. A residential rehabilitation facility would be an excellent setting for a health promotion intervention because consumers would already be onsite, so the intervention would be easily accessible to them. The intervention could be incorporated into the regular classes that consumers attend at the facility or could be established as a separate class or "afterhours" meeting.

Although health promotion is not the typical kind of assistance that vocational rehabilitation agencies provide, it would coincide with the agencies' overarching goal of assisting persons with disabilities to obtain (or maintain) employment. Although evidence in this area is limited, one study found that persons who are visually impaired who are healthier are much more likely to be employed (Kirchner, Schmeidler, & Todorov, 1999). Health promotion activities would help participants feel better physically and mentally, which, in turn, should help them be better able to handle the demands of working.

At least two methods of implementing such a program would be available to vocational rehabilitation agencies. A healthy living class could be offered, similar to what would be available at a residential facility. The class could be conducted by vocational rehabilitation personnel or a contracted vendor. Such a program is being pilot-tested in one state with vocational rehabilitation consumers with mobility impairments (C. Ipsen, researcher, personal communication, June 15, 2006); a similar program could be developed specifically for adults who are visually impaired. Another option would be for rehabilitation teachers to provide a healthy living curriculum to consumers as a component of the other services that the consumers are receiving in their homes.

Rehabilitation counselors would also need to emphasize to consumers the importance of healthy living and encourage them to participate in health promotion activities. These health promotion activities could be another service option available to consumers (under the category of "other services"). Adding a service such as this may require additional resources of the vocational rehabilitation agency (either in personnel time or money), but the potential benefits in terms of consumers' improved health, enhanced quality of life, and employment would be worth the effort.

Community-based interventions

Health promotion interventions, also referred to as healthy-lifestyle interventions,

are becoming popular across the country with the increased incidence of overweight and obesity. Many communities are offering these types of programs for the general population. For example, Mississippi State University's Extension Service (n.d.) offers a 12-week educational healthy lifestyle program in many counties across the state. This program, called Mississippi in Motion, is available for a nominal fee to anyone who resides in the community. It consists of an initial meeting at which baseline information (such as weight, height, BMI, blood pressure) is gathered, 10 weekly meetings during which information on healthy living (such as healthy cooking, exercising, and making smart food selections when eating out) is provided, and a final meeting at which the participants' physiological information is again gathered. The goals of the program are for participants to increase their knowledge of healthy behaviors and levels of physical activity and improve their eating habits. Participants are encouraged to form five-member teams that compete for prizes to be awarded at the end of the program. Similar types of programs are being offered nationwide.

Although adults who are visually impaired would not be restricted from participating in community programs such as these, they may confront several obstacles to full participation, such as the lack of transportation and knowledge about exercise options and inaccessible fitness facilities. Also, these community-based programs generally will not be prepared to provide even basic accommodations, such as information in alternate media. Despite the difficulties that participating in community-based interventions may present for adults who are visually impaired, they are an important option to consider if they are available in a community. One excellent benefit that they offer is greater involvement in the community. A person who is visually impaired who is interested in participating should contact the director of the program in his or her community before the program starts to request accommodations and to inform the director about his or her needs. Another possibility is for a local blindness advocacy group (which may be a vocational rehabilitation agency or a consumer group) to partner with the community program to provide education and training about working with persons who are visually impaired. The advocacy group could be available to answer questions from persons who provide the intervention and could assist them in obtaining educational material in alternate media.

Consumer groups

The population of adults with visual impairments is unique in that it has strong consumer groups with large numbers of members. These consumer groups represent another important option for health promotion activities. Although they would not implement a formal intervention for their members, they could provide education about healthy habits and establish a support network for members that would encourage healthy behaviors, which could lead to weight loss and improved health. Education could be provided in the monthly publications of these groups, with a column devoted to a "healthy lifestyle" topic. State or local chapters of the organizations could hold support group meetings or create online support groups. Members of local chapters may have the opportunity to exercise together, which would help them continue to exercise. Compared to sighted

adults, adults with visual impairments may face more challenges to maintaining a healthy lifestyle. Having a support network that consists of others who understand these challenges would be beneficial to them.

Conclusion

Health promotion is important for all people, given that an increase in physical activity and a decrease in weight are associated with fewer health problems and therefore decreased costs for health care and a better quality of life (Kolotkin et al., 2001; Oster et al., 1999). For persons with disabilities, these changes can also result in fewer secondary conditions and greater functional abilities, again resulting in a better quality of life and substantially lower health care costs (Lollar & Crews, 2003). The U.S. government is one of the strongest supporters of health promotion activities, as evidenced by its *HP2010* plan. Given what is known about the challenges that adults who are visually impaired may face in maintaining a healthy lifestyle and their poorer health status, it is important that health promotion interventions be implemented that will allow for their full participation. Despite the recent focus on health promotion for persons with disabilities, adults with visual impairments have not yet received adequate attention. The challenges they face and the documented evidence of their disparities in two of *HP2010*'s leading health indicators (physical activity and overweight and obesity) necessitate the implementation of accessible health promotion activities and interventions. The field of visual impairment needs to focus attention on this area, to improve the health and well-being of the people it serves.

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Michele Capella-McDonnall, Ph.D., CRC, *assistant research professor, Rehabilitation Research and Training Center on Blindness and Low Vision, Mississippi State University, P.O. Box 6189, Mississippi State, MS 39763; e-mail: <mec10@msstate.edu>.*