



Accessibility and types of recreation facilities related to promotion of physical activity

Public health implications for overweight and obese people in Wisconsin

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Executive Summary



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This study attempts to understand how policies and environmental interventions improve health outcomes, especially in the overweight and obese population, by identifying various types of recreation facilities and physical activities.



Few studies have examined the association between access to recreation facilities and the willingness of overweight and

obese people to exercise, as well as the best types of recreation facilities to encourage exercise in this population. The current study therefore addresses this research gap by focusing on the different types of barriers that discourage this population from using outdoor recreation facilities to exercise.

Some published evaluations of policies and environmental interventions to promote physical activities in the obese population are reviewed. A comprehensive list of six-digit NAICS codes for recreation facilities and resources was also built to identify existing recreation facilities in Wisconsin. Furthermore, a table of metabolic equivalents is associated with different types of barriers that impede exercise to identify reasonable recreation

facilities and physical activities for overweight and obese people.



Results showed that walking and bicycling are the two types of physical activities that are easiest to adopt and adhere to over the long term. Parks and other similar places, such as trails and amusement and recreation facilities, tend to have significant health benefits for overweight and obese people. An array of personal and environmental factors, particularly those related to barriers to implementation, were considered in proposed policies to promote physical activity in overweight and obese people.

Introduction

Overview



Accessibility to outdoor recreation has been shown to increase health benefits and wellness for local residents. In this study, I examine the inclusion of health and wellness in outdoor recreation planning. The effect of accessibility of outdoor recreation facilities on willingness to engage in exercise is studied in this paper. An assessment of the health benefits in Wisconsin is made in the Statewide Comprehensive Outdoor Recreation Plan (SCORP 2012), a document that is published every five years in Wisconsin as required by the Federal Land and Water Conservation Fund Act of 1965.

The SCORP describes and quantifies some of the most important benefits of recreation and establishes goals to improve the quality of outdoor recreation for local residents. The present study extends such an assessment done in the SCORP and further targets the evaluation of several key relationships, which include public health and wellness, access to recreation facilities, and obesity. Identifying the types of recreation facilities that provide the greatest health benefits and that are most reasonable for overweight and obese people can encourage this group to participate actively in outdoor recreation activities.

Overweight and obesity have been linked in the public health literature to a variety of diseases and health problems (Mokdad et al. 2003). In particular, overweight and obesity are associated with high blood pressure, gallbladder disease, osteoarthritis, and type 2 diabetes mellitus. Such an association, which is consistent for both men and women, becomes stronger as a person becomes heavier. Furthermore, as a person's weight increases, his or her chance of acquiring two or more of chronic conditions becomes higher (Must et al. 1999). The complexity of the interactions and the potential for gains and losses is also pertinent to nutrition. The consumption of foods high in fat and sweeteners is increasing and intake of fruits and vegetables remain inadequate. These poor quality diets are associated with rising rates of overweight, obesity and diet-related diseases.

Many studies have stated factors contributing to poor nutrition. The presence of food stores appears to contribute to the eating pattern of neighborhood residents (Glanz and Yaroch 2004). Accordingly, the availability of supermarkets in neighborhoods was associated with better-quality diet (Moore et al. 2008) and a lower prevalence of overweight and obesity in adults (Morland et al. 2006). However, fast-food restaurants have been identified as a potential contributor to a higher prevalence of overweight and obesity (Brownell 2004) and in particular is partially explained among economically disadvantaged populations in poor neighborhoods (Cummins and Macintyre 2002).

While physical inactivity generally does not lead to overweight and obesity, low and declining levels of physical activity and an inappropriate diet affect the rise of overweight and obesity rates (Mokdad et al. 2003). By contrast, increased physical activity and decreased sedentary behavior are associated with a decline in overweight and obesity rates (The Surgeon General's Vision for a Healthy and Fit Nation 2010). The Surgeon General's report concluded that the rate of weight loss is associated with the frequency and duration of a physical activity. The combination of increased physical activity and diet management is more effective than diet-alone management for long-term weight regulation.

Understanding the nature of the association between outdoor recreation facilities and obesity is also important. The association between obesity and the built environment has been evaluated according to environmental factors, such as community design, presence of food stores, proximity and accessibility to parks and recreation facilities, and other outcomes, such as social status, gender, age, physical activity, and body mass (Durand 2011).

Understanding the impact of the built environment on obesity also provide information necessary to develop successful community-based prevention efforts. Researchers need to consider all the many different built environment to which humans are exposed across their lives. This includes consideration of both residential space and activity space, as well as the connection between these areas. Environments of interest might include residential space, work space, recreational space, and characteristics of the travel and street environment between work, shopping, and personal business, social and recreational activities. For example, the amount of time spent daily in commuting between work and home, connectivity among different neighborhoods, and the amount of mixed-use units in neighborhoods, as well as the quality of a person's daily commute such as time spent in walking or biking, are drawing attention for its potential impact on health.

For specific environmental factors, such as residents who live in sprawl counties, they have been found to weigh more and exercise less through a measurement of the sprawl index based on metropolitan and county level (Sturm et al. 2004). By contrast, a mixed use land pattern as mediated by physical activity presents a strong association with decreased odds of obesity (Frank et al. 2004). The physical environment has been shown to be associated with physical activity because the quality of the built environment is related to overweight and obesity.

Research Questions

- **What are the potential linkages between access to recreation facilities and the willingness of overweight/obese people to exercise?**

One study indicates that the number of private recreational facilities within 1 mile explained the significant amount of physical activity for girls whose age ranged from 11 to 15 years (Norman et al. 2006). This result is consistent with those in other studies showing that improved access to recreation facilities is significantly associated with increased levels of physical activity (Kahn et al. 2002). The findings of an Australian study suggest that access to both free and paid recreation facilities can make physical activity likely (Sallis et al. 1998). In a research of various counties, Rosenberger (2005) argued, however, that recreation opportunities do not directly affect the rates of obesity. Burdette and Whitaker (2004) found that overweight or non-overweight in low-income children was correlated with distance to playgrounds, fast food restaurants, and level of safety.

The reported number of convenient facilities is strongly associated with physical activity, particularly increased light-to-vigorous exercise in adults. Studies show that people are likely to walk and exercise if recreation facilities can be found nearby (Sallis et al. 2009). In another study (Godbey 2009), however, respondents generally believed that recreation facilities and parks are specifically designed for certain sport teams; the majority of the people prefer unstructured exercises, such as brisk walking and cycling instead of using recreation facilities.

- **After identifying the personal and environmental barriers that discourage overweight and obese people from exercising, which types of recreation facilities are then most reasonable to encourage this population to exercise?**

High enjoyment and preference are both significantly associated with participation rate in physical activity; a study reported that a sedentary lifestyle and physical inactivity are associated with barriers, such as cost, time, the weather, and personal barriers (Leslie et al. 1999). In the study of Salmon et al. (2003), personal barriers, such as lack of time, other priorities, work, and family commitments, were generally associated with reduced time for physical activity. By contrast, perceived environmental barriers to physical activity were less likely associated with participation rate in physical activities than personal barriers, which are perceived as primary barriers. Walking and other moderate-intensity activities were also considered as inexpensive activity options compared with structured, vigorous-intensity leisure-time physical activities, which people perceive as costly (King et al. 1995).

The major types of recreation facilities and recreation activities in Wisconsin, as shown in the 2011 to 2016 Wisconsin SCORP, are presented in Section 3, which focused on outdoor recreation and public health. These recreation activities were used to determine the need for different types of recreation facilities that provide potential health benefits for Wisconsin residents and recreation visitors. Because one goal of the 2011 to 2016 Wisconsin SCORP is to improve public health through increased opportunities for physical activity, the overweight and obese population should especially be considered in the analysis.

Methods

Several published studies that evaluated environmental and policy interventions to increase physical activity were reviewed. A literature search was conducted to gain perspective on previously recognized obesity prevention efforts that focus on how to promote physical activity through policy and environmental interventions.

MEDLINE



MEDLINE, through the Web of knowledge databases, was chosen for my search that aimed to locate a range of articles relating to the association between the promotion of physical activity and the presence of recreation facilities in preventive medical, urban planning, and public health journals, as well as in government and non-government organization reports. After searching these databases, I analyzed bibliographies from similar previous reviews to identify additional articles. The keywords used for searching in MEDLINE and the Web of knowledge databases were “obesity,” “overweight,” “MET,” “physical activity,” “policy implications,” and “types and characteristics of recreation facilities or the built environment.”

NAICS

The measure of recreation facilities was derived from a large list of four-digit Standard Industrial Classification (SIC) codes. SIC was originally developed in the 1930s to classify establishments according to the type of activity they are primarily engaged in and to promote comparison of establishment data that describe various facets of the US economy. However, rapid changes in both the US and world economies brought about a new approach, the North American Industry Classification System (NAICS), to classify economic activity. NAICS industries are identified by a six-digit code in contrast to the four-digit SIC code, to facilitate flexibility in subsectors. A comprehensive list of six-digit NAICS codes for recreation facilities and resources was built. These NAICS codes were summarized into a single measure of all facilities and subdivided into small categories of specific types of facilities, with

some overlaps between categories (Table 1).

Metabolic Equivalent



A shorthand method to estimate energy expenditure during physical activity is the metabolic equivalent (MET). One MET is defined as the energy expenditure associated with quiet sitting. The MET values of a list of activities, such as walking, basketball, and softball, were calculated. MET values and Wisconsin outdoor recreation activities were associated from an identification of the different barriers, risks of injury, and levels of difficulty to motivate overweight and obese people to adopt a physically active lifestyle.

However, the main focus of NAICS and recreation facilities is on infrastructure to support private sectors and formal sports. Some studies (Andrew et al., 1981; Sallis et al. 1990) found that the most frequently used recreation facilities were in public facilities, including the streets, public parks and open spaces, and public recreation area. This may also reflect the popularity of walking or biking for transport and recreation facilities. This study suggests that NAICS should be extended to public facilities (including streets, sidewalks, public parks, and public trails) deserve recognition as an important component of the community infrastructure to support physical activity behavior. Therefore, methods for identifying public facilities such as public parks, trails, and other public recreation facilities were used to obtain data from county planning or local park and recreation department.

The analysis and evaluation of recommendations that encourage overweight and obese people to be physically active were conducted on the basis of common outdoor recreational activities in Wisconsin as provided by the 2011 to 2016 Wisconsin SCORP. The rater assigns a score (ranging from 1 to 3) to each of the barriers to participation, level of risk factor (low risk level: 1, medium risk level: 2, and high risk level: 3), and level of difficulty in adoption and adherence (low level: 1, medium level: 2, and high level: 3) according to whether the barrier is considered low, medium, or high level. These scores are summed, with the final scores ranging from 0 to 11. A higher score indicates a stronger barrier to promote physical activity among overweight and obese people. Any type of activity with a score of 0 to 7 should be addressed in the recommendations in terms of activities and opportunities that overweight and obese people can engage in. Based on an assessment of the different intermediary Wisconsin recreation activities that are linked with appropriate outdoor recreation facilities, the recommendations specifically target the overweight and obese population.

Table 1: Types of physical activities and recreation facilities according to the NAICS code

Facility Type	NAICS	Examples
Historical sites	712120	Archeological sites, heritage villages, historical sites, etc.
Zoos and botanical gardens	712130	Arboretums, botanical gardens, zoos, wild animal parks, aquariums, etc.
Nature parks and similar institutions	712190	National parks, nature centers, nature parks, state parks, local parks, conservation center, etc.
Amusement and theme parks	713110	Outdoor theme parks, water parks, amusement parks
Golf courses and clubs	713910	Golf course, disc golf, golf
Skiing facilities	713920	Skiing, snowshoeing, sledding, dog sledding, downhill skiing, etc.
Fitness and recreational sports centers	713940	Handball, volleyball, baseball, softball, soccer, basketball, tennis, football, paintball, etc.
All other amusement and recreation facilities	713990	Swimming, kayaking, beach clubs, fishing clubs, trail riding, shooting clubs, etc.

Results



Types of recreational facilities



Table 2 shows the categories of the different types of recreational facilities and physical activities according to the data set from the 2011 to 2016 Wisconsin SCORP.

The participation rates for different recreation facilities were also assessed in the 2011 to 2016 Wisconsin SCORP, and such rates represented the need to meet recommendations in terms of

popularity, feasibility, and accessibility. The proximity of facilities to one's residence or workplace also affects a person's ability and willingness to engage in recreational activities. In terms of facilities, the most reasonable types of recreational facilities for overweight and obese people in Wisconsin can be identified in current moderate-intensity activity recommendations, ranking of injury rates in terms of various sport and recreation-related activities, and level of difficulty in adherence.

The activities listed include vigorous-intensity (METs>6) team sports (e.g., handball, ice hockey, football) and individual sports (e.g., tennis outdoor, racquetball), standard types of individual exercises (e.g., running, rowing, scuba diving), running, and mountain bicycling. The activities also include moderate-intensity (3<METs<6) and light-intensity activities (METs<3) for the different types of recreation activities. The table does not list all possible barriers, particularly environment barriers, which people may confront in different situations according to their geographic location. Notably, the types of recreation activities, evaluation of barriers, injury risks, and levels of difficulty in adherence presented in Table 2 are somewhat subjective. The specified METs value for each type of physical activity is consistent with the 2011 to 2016 Wisconsin SCORP data set. Nevertheless, the purpose of the table is illustrative: to describe the unique attributes of each type of physical activity in Wisconsin and to make recommendations on the best physical activities that overweight and obese people can engage in over time.

Analysis & Evaluation

Each activity possesses a unique combination of attributes in terms of METs, barriers of participation, sport-related injury risk, and level of difficulty in adherence for the overweight and obese. According to the table, golf, for instance, is considered a moderate-intensity activity when the player is walking and carrying a bag at the golf course. The same table shows that golf involves three primary barriers. First, participants need to prepare their own golf equipment and pay to be able to play at a golf course, and this is obviously expensive. Second, golf requires a significant amount of leisure time. Finally, golf is not always an available activity because of weather conditions. Table 2 shows that golf is considered a moderate-intensity activity and has middle ratings in terms of injury risk, level of difficulty to engage in, and sustainability over a long period of time. Although golf requires a substantial amount of time and money, with low-income people having limited opportunities to play such a resource-intensive sport, golf is still recommended for people who are in search of opportunities to increase physical activity, especially among the overweight and obese.

The same logic is applied to the rest of the activities in the table. Vigorous-intensity activities that require high energy exertion and involve personal and environmental barriers are not recommended for the overweight and obese. Because the majority of the population is completely sedentary or irregularly active, including overweight and obese people, adopting vigorous forms of physical activities is not recommended. Once these are adopted, long-term adherence will be difficult because of the need for a high skill level, equipment, access to facilities, and sufficient time, as well as the high injury risk involved and unavailability for all seasons because of weather conditions.

Table 2 provides the basis for concluding that walking and bicycling are the two types of physical activities that are easiest to adopt and adhere to over the long term. Four reasons can be given on why walking and bicycling are highly recommended not only for overweight and obese people but also for the majority of the population. First, the level of skill required in these activities is low. Walking and bicycling require moderate to vigorous intensities because they can take any combination, such as walking

Table 2-1: Types of vigorous-intensity physical activities: Analysis and evaluation

Type of physical activity	NAICS code	MET	Barriers to Participation					Risk of injury			Levels of difficulty			Score	Recommended for overweight and obese people
		Vigorous (>6) Moderate (3-6) Light (<3)	High skill level	Equipment/ facilities required	Leisure time needed	Other participants	Unavailable for all seasons	Low	Mid	High	Low	Mid	High		
Inline skating (rollerblading)	713940	12.5	X	X	X		X		X			X	9		
Rock climbing, ascending rocks	712190	11.0	X	X	X	X	X			X		X	11		
Orienteering	712190	9.0	X	X	X					X		X	9		
Running, cross-country, jogging	712190	9.0			X				X		X		5	X	
Mountain biking or BMX	712190	8.5	X	X	X		X			X		X	10		
Handball, general	713940	8.0	X	X	X	X	X		X			X	10		
Rock climbing, rappelling	712190	8.0	X	X	X	X	X			X		X	11		
Mountain climbing	712190	8.0		X	X	X	X			X		X	10		
Bicycling, general	713990	8.0		X					X		X		5	X	
Skiing, cross-country	713920	8.0	X	X	X		X			X		X	10		
Snowshoeing	713920	8.0		X	X		X		X			X	8		
Ice hockey, outdoors	711211	8.0	X	X	X	X	X		X			X	10		
Volleyball, outdoors, beach	713940	8.0		X	X	X	X	X				X	8		
Football, touch, flag, general	711211	8.0	X	X	X	X	X			X		X	11		
Backpacking, wilderness	712190	7.0		X	X		X		X		X		7	X	
Canoeing, moderate effort	713990	7.0	X	X	X		X		X			X	9		
Rowing, moderate effort	713990	7.0	X	X	X	X	X		X			X	9		
Scuba diving	713990	7.0		X	X	X	X		X			X	9		
Sledding	713920	7.0	X	X	X		X		X			X	9		
Ice skating, outdoors	711190	7.0	X	X	X		X		X			X	9		
Dog sledding	713920	7.0	X	X	X		X		X			X	9		
Tennis, outdoors	713940	7.0	X	X	X	X	X		X			X	10		
Racquetball, casual, general	713940	7.0	X	X	X	X	X		X			X	10		
Soccer, casual, general	711211	7.0	X	X	X	X	X		X			X	10		

Source: Wisconsin 2011-2016 SCORP

for pleasure and easy riding around streets to brisk walking and mountain bike racing, which are very strenuous sports. Second, they are also practical exercise forms to commute to schools, workplaces, or shopping malls. Third, they involve few barriers for the participants. Finally, the risks of walking and bicycling

range from low to high because many different types of walking and bicycling can be performed.

For obese population

For the overweight and obese, walking and bicycling are appealing because the exertion threshold, cost, and facility-related barriers to participation are much lower than those in other types of

physical activities in Wisconsin and even in the entire US. Walking and bicycling can be done with little or no money and thus give overweight and obese people the greatest potential advantage among all other forms of physical activities in terms of health benefits.

Table 2-2: Types of moderate-intensity physical activities: Analysis and evaluation

Type of physical activity	NAICS code	MET	Barriers to Participation					Risk of injury			Levels of difficulty			Score	Recommended for overweight and obese people
		Vigorous (>6) Moderate (3-6) Light (<3)	High skill level	Equipment/ facilities required	Leisure time needed	Other participants	Unavailable for all seasons	Low	Mid	High	Low	Mid	High		
Hiking, general	712190	6.0		X	X				X		X			5	X
Hunting, big game	713990	6.0	X	X	X				X			X		7	X
Hunting, migratory bird	713990	6.0	X	X	X				X			X		7	X
Paintball	713940	6.0	X	X	X	X	X		X				X	10	
Swimming in lakes, streams, etc.	713990	6.0			X		X		X			X		5	X
Waterskiing	713990	6.0	X	X	X		X			X			X	10	
Skiing, downhill	713920	6.0	X	X	X		X			X			X	10	
Snowboarding	713920	6.0	X	X	X		X			X			X	10	
Basketball, general	711211	6.0	X	X	X	X	X			X			X	11	
Hunting, small game	713990	5.0	X	X	X				X			X		7	X
Rafting	713990	5.0	X	X	X	X	X		X				X	10	
Snorkeling	713990	5.0		X	X		X		X			X		7	X
Kayaking	713990	5.0		X	X		X		X			X		7	X
Skateboarding	712190	5.0	X	X	X		X			X			X	10	
Baseball	713940	5.0	X	X	X	X	X			X			X	11	
Softball	713940	5.0	X	X	X	X	X		X			X		9	
Golf	713910	4.5		X	X		X		X			X		7	X
Gardening, general	713990	4.0			X		X		X			X		6	X
Horseback riding, general	713990	4.0		X	X		X	X				X		6	X
Swimming, moderate effort, pool	713940	4.0		X	X		X		X			X		7	X
Walking for pleasure	712130	3.5			X			X			X			3	X
Snowmobiling	713920	3.5	X	X	X		X		X				X	8	
Geocaching	712190	3.3		X	X			X				X		5	X
Visiting a dog park to walk a pet	712190	3.0			X			X			X			3	X
Fishing, general, warm water	713990	3.0		X	X			X				X		5	X
Sailing	713990	3.0	X	X	X		X		X				X	9	
Windsurfing	713990	3.0	X	X	X		X		X				X	9	
Surfing	713990	3.0	X	X	X		X		X				X	9	
Disc golf, frisbee, general	713910	3.0		X	X		X	X				X		6	X

Source: Wisconsin 2011-2016 SCORP

Table 3 indicates that the presence of nature parks and other similar settings, such as national parks, state and local parks, trails, and other amusement and recreation facilities (e.g., for bicycling,

swimming, gardening, camping) tends to have significant health benefits for overweight and obese people. Wisconsin is home to countless trails and state and local parks that encourage obese people

to increase their physical activity levels in these natural and enjoyable settings. However, some organized sports, such as basketball, soccer, football, and tennis, involve vigorous intensities

Table 2-3: Types of light-intensity physical activities: Analysis and evaluation

Type of physical activity	NAICS code	MET	Barriers to Participation					Risk of injury			Levels of difficulty			Score	Recommended for overweight and obese people
		Vigorous (>6) Moderate (3-6) Light (<3)	High skill level	Equipment/ facilities required	Leisure time needed	Other participants	Unavailable for all seasons	Low	Mid	High	Low	Mid	High		
Camping, moderate effort	713990	2.5		X	X		X	X			X			5	X
Off-road motorcycling	713990	2.5		X			X	X			X			4	X
Off-road driving with an ATV	713990	2.5		X				X			X			3	X
Yard games	712190	2.5			X	X	X	X			X			5	X
Target shooting	713990	2.5	X	X	X			X				X		5	X
Boating, power boat	713930	2.5		X	X		X	X			X			5	X
Viewing/photographing birds	712130	2.5		X	X			X			X			4	X
Visiting the wilderness area	712190	2.0			X			X			X			3	X
Visiting a farm or agricultural setting	712190	2.0			X			X			X			3	X
Off-highway vehicle driving	713990	2.0		X				X			X			3	X
Driving for pleasure	713990	2.0		X	X			X			X			4	X
Visiting outdoor theme/water parks	713110	2.0		X	X	X	X		X		X			6	X
Ice fishing	713990	2.0		X	X		X	X				X		5	X
Viewing natural scenery	712190	2.0		X	X			X			X			4	X
Visiting nature centers, etc.	712190	2.0			X			X			X			3	X
Visiting a waterside	712190	2.0			X			X			X			3	X
Viewing other wildlife forms	712190	2.0		X	X			X			X			4	X
Sightseeing	712190	2.0			X			X			X			3	X
Viewing/photographing wild flowers	712190	2.0		X	X			X			X			4	X
Visiting historic sites	712120	2.0			X			X			X			3	X
Gathering mushrooms, berries, etc.	712130	2.0		X	X			X			X			4	X
Viewing/photographing fish	712190	2.0		X	X			X			X			4	X
Visiting prehistoric sites	712120	2.0			X			X			X			3	X
Nature-based educational programs	712190	2.0		X	X			X			X			4	X
Boat tours or excursions	713930	2.0		X	X		X	X			X			5	X
Visiting a cave	712190	2.0			X			X			X			3	X
Family gathering	712130	1.5			X			X			X			3	X
Picnicking	712190	1.5			X		X	X			X			4	X
Attending outdoor concerts, etc.	711320	1.5			X		X	X			X			4	X

Source: Wisconsin 2011-2016 SCORP

with different levels of participation in Wisconsin, so a high level of injury risk and difficulty in adherence are the barriers for participation in these

activities by overweight and obese people.

Limitations

Overweight and obese people who experience higher numbers of

personal barriers such as lack of time or risk of injury are known to be less active. The results confirm that barriers are experienced differently by different segments of this population.

Table 3: Number of activities recommended for obese people according to the NAICS code

Facility Type	NAICS	Number of activities recommended for obese people
Historical sites	712120	2
Zoos and botanical gardens	712130	4
Nature parks and similar institutions	712190	18
Amusement and theme parks	713110	1
Golf courses and clubs	713910	2
Skiing facilities	713920	0
Fitness and recreational sports centers	713940	1
All other amusement and recreation facilities	713990	17
Total		55

Source: NAICS Association, 2012. <http://www.naics.com/free-code-search/sixdigitnaics.html?code=71>

There are several limitations to this study. First, some data were categorized from North American Industry Classification System (NAICIS) code. There is an inherent limitation of this type of method including failed in representation of public facilities such as public spaces, public parks, and trails. Though most physical activities was taken directly from 2011-2016 SCORP, access to facilities and types of facilities have not been systematically examined. Second, tested scales were used whenever possible. These personal and environmental

barriers in particular are subject to bias due to self-selection and subjective. Perception of personal and environmental barriers may differ greatly between those who are active and those who are not in overweight and obese population. A final limitation is that there may be interaction effects particularly between income levels, race, age, diet management, and different levels of barriers. The degree of interaction may also vary between urban, suburban, and rural areas as much as the environmental characteristic themselves, and high skill and equipment required,

facilities and time needed as much as personal characteristic.

In addition, lower income people from urban and rural areas were more likely than others to report poor health or fear of injury as barriers to physical activity. Some significant differences across income levels, urban/rural areas, race, age in promoting physical activity could exist for those who have certain barriers to exercise. If these differences were associated with physical activity, they may have biased the results in either direction.

Conclusions and Recommendations

Conclusions



Engaging in physical activity can have substantial benefits in improving the health of obese people through a reduction in the incidence of chronic

diseases, such as heart disease, diabetes, and cardiovascular disease. As a result, the quality of life of individuals is enhanced. However, efforts to eliminate health disparities must be addressed in future policies. The personal and environmental barriers, sport risk factors, and level of difficulty in exercise adherence of overweight and obese people need to be considered in policies to best promote the welfare of this group. Based on the findings of this study, the following policy recommendations are put forward:

Recommendations

- Improve access to recreation facilities, especially for overweight and obese people, through a reduction in costs for the use of such

facilities and for participation in relevant programs and extension of operation hours

- Fund research on safe sport participation (i.e., injury prevention), particularly for the overweight and obese in Wisconsin, and include this factor in a progressive exercise design for obesity and exercise education
- Encourage various agencies to provide incentives for physical activity, such as by giving rewards to those who commute by walking or bicycling
- Implement a free educational and behavioral change program, such as by teaching sport skills that can help people start a new physical activity regimen and encouraging people to use their physical environment to exercise
- Future studies can benefit from the use of new measures on the quality of facilities, so that outdoor recreation planners can assess the actual access to facilities, and governments at various levels can give priority to providing facilities that are accessible to all Wisconsin residents.



Future promotional campaigns that focus on increased participation in physical activity and increased use of recreation facilities among the Wisconsin population must present an inclusive image that encourages the overweight and obese, in particular, to participate in regular physical activity. In this regard, organizations working to promote physical activity should also provide resources and funding for obesity-related programs. One example is the National Physical Activity Plan

(www.physicalactivityplan.org/), which is a comprehensive set of policies, programs, and initiatives that aim to promote physical activity. Hundreds of different organizations are working together to change communities in all segments of the American population and help them become physically active. Increasing access to facilities and physical activities for the overweight and obese will entail a cohesive and structured plan that emphasizes the equal exercise needs of the majority of the population.

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