

State of the Science: Health, Wellness and Disability

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Title Of Presentation: A Focus on Physical Activity

PRESENTATION BRIEF

- I. **Introduction:** Over the past few decades, our lives have been changed by technology, much of which has created a situation that is not good for our health. Many forms of technology have promoted physical inactivity, and thus we have found ways to do more things without having to move. This ranges from where and how we identify what foods we eat, to how we move from place to place throughout the day, to how we choose to use recreation time. Some technology has enabled those with physical disabilities to maximize their movement potential, yet most forms of technology have resulted in higher levels of inactivity leading to greater health risks among youth, adults and seniors. Experts are predicting that the current generation of children will be the first generation to not outlive their parents. This is primarily due to two interrelated but highly changeable behaviors: inactivity and poor diet. Numerous reports in peer-reviewed journals have recognized this growing health concern and have predicted that the number of people who will be exposed to many different chronic health conditions (e.g., coronary heart disease, stroke, cancer, type 2 diabetes, chronic obstructive pulmonary disease) will increase substantially over the coming years. Unfortunately, the majority of the media coverage has focused on the general population and relatively little information is known about how inactivity in particular, and inactivity and obesity in combination, will affect the health and wellness of people with disabilities. This presentation will focus on what we currently know about the effects of physical activity (PA) on people with disabilities, and what we need to know in the future in order to prescribe safe and effective programs for this population.

Over the past decade there is an increasing body of evidence supporting active lifestyles as one of the best investments for individual and community health (Bauman et al, 2002). For the past 10 years U.S. governmental agencies have identified PA as a leading health indicator directly correlated with the development of chronic diseases. The standard recommendation for adults is 30 minutes of moderate intensity PA on most, if not all, days of the week (recommendation for children is 60 minutes a day). But does that work as a recommendation for people with various types of disabilities including

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intellectual disability (ID), cerebral palsy (CP), multiple sclerosis (MS), or spinal cord injury (SCI)? While there is substantial evidence on the general population that physical inactivity is associated with higher risk for various chronic diseases and death, there is substantially less evidence on people with disabilities who are generally at an even higher risk for health concerns.

Understanding physical activity is confusing to some. Does that include exercise, doing the dishes, cleaning the bedroom, playing basketball? How do we evaluate intensity of physical activity? When is it moderate intensity? What is exercise and how does that differ from physical activity? How is fitness classified in ways that we can determine implications for health? How do we keep it all straight and make moderate intensity physical activity a planned part of most if not all days?

Generally we want to encourage all people to participate in moderate intensity physical activity that involves as many muscle groups as possible and that can be sustained for several minutes at a time. This can include raking the yard, pushing your wheelchair or walking briskly. Most experts agree that performing certain activities slowly or with a low intensity will not achieve the same health benefits as moderate intensity activity, but for people who fall into the sedentary “couch potato” category (physical activity less than one day per week), even a little physical activity can achieve certain health benefits compared to doing nothing at all. And some experts say that the greatest benefits derived from physical activity are achieved by people at the lowest ends of the physical activity continuum (i.e., couch potatoes).

Categories of Physical Activity

Physical activity refers to any type of movement that increases energy expenditure through the contraction of skeletal muscle above resting levels. Exercise is a sub-category of physical activity that is planned and purposeful and can be used to improve or maintain fitness (Stanish, Temple and Frey, 2006). Physical fitness is an attribute of moderate to vigorous levels of physical activity and can be categorized as performance-related (i.e., as in sports competition) or health-related. Health-related fitness includes cardiorespiratory endurance, muscular endurance, muscular strength, flexibility, and body composition). Skill-related fitness is more related to concepts such as speed, agility, balance and coordination. Obviously the terminology can be confusing and people often confuse physical activity with physical fitness. What we are currently most concerned about are the levels of moderate intensity physical activity that can help to attain health related benefits. This in turn may lead to improving levels of body composition,

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maintaining strength to do various work- and home-related task, and reducing coronary risk factors such as high blood pressure and high cholesterol. These can be acquired through targeted exercise programs or through participation in daily physical activities of moderate to vigorous intensity in the home, yard or at work.

- II. **Research Objective/Research Question or Training Goals:** This paper will summarize the research identified in this systematic review of the literature on physical activity, fitness, and exercise interventions to improve the health status of persons with various disabilities. There were three objectives to (a) Determine if people with disabilities receive similar cardiovascular, musculoskeletal, metabolic, psychological and functional health benefits as people without disabilities; (b) Examine if these benefits were demonstrated across multiple groups of people with various disabilities; and (c) Identify the health outcomes achieved from the reviewed studies across settings and time. The findings from this review will help establish what is known, what is not known, and where the next stage of research needs to be conducted to address gaps in the research literature.
- III. **Methods:** This systematic literature search to perform a scoping review on the community-based physical activity interventions for adults with disabilities from 1986 to 2006. The complete process for the identification and selection of articles was described earlier. The total number of physical activity related articles reviewed across all disabling conditions was 135. The overwhelming majority (101/135) addressed populations with functional disabilities identified as physical/mobility impairments. To gain a better understanding of the types of research completed, a follow-up review of the abstracts and published articles was done by a content expert to identify the types of interventions and targeted outcomes. This portion of the review did not attempt to determine statistical power of the findings based upon research methodology and/or effect size of the intervention. Rather, an attempt was made to identify whether the interventions occurred in a clinical/rehabilitation setting or community-based setting, the types of disabling conditions that were more frequently investigated, the types of health promotion interventions planned, and the outcome measures targeted for behavior change.
- IV. **Results:** The follow-up analysis of the original 135 articles indicated that 85 studies attempted to analyze the implementation of some form of physical activity/health promotion program targeting one or more health outcomes. From these selected articles, about half were clinical intervention programs and half were community based interventions. The vast majority of these studies were short-term exercise interventions with the primary outcome being

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a change in performance on one or more health related or biological measure, motor skill measures such as balance, or functional gait/mobility changes. A breakdown of the articles by primary outcome measure is below. As an example, 27 of the articles measured psychological changes from participation in some type of educational program. These measures included changes in attitudes, perceptions, mood states, and health-related quality of life. A few of the interventions measured changes in multiple physical and psychosocial dimensions. Fewer attempted to determine if the health promotion programs also influenced secondary conditions such as pain or fatigue.

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Benefits in Primary Outcome Measures	Clinical Exercise Intervention	Community-based Exercise
Muscular Strength	7	10
Physical Activity		2
Aerobic Endurance	8	7
Psychological/Mental	10	17
Functional/Movement Gait/Balance	18	9
Obesity or other cardiac risk factors	6	2
Secondary Conditions	3	3

Overwhelming evidence from these studies supports planned interventions of exercise and/or health promotion programs for improving health outcomes in people with disabilities. This was noted across the majority of the published articles. However, there is some caution about interpreting these findings for the following reasons: (a) Many of the studies had small experimental groups which limits the ability of the researchers to generalize the findings; (b) There were only a handful of randomized controlled trials; (c) The positive effects of the interventions were not demonstrated across all groups or on all measures; (d) Most of the studies were short-term in nature and did not measure maintenance of the achieved health behavior across time. In addition, few studies actually measured changes in function that improved quality of life. Instead, the studies only measured changes that existed after the intervention, with few implications for improving function that would generalize to the targeted disability group.

- V. **Conclusions:** There is a need for more research on health outcomes associated with physical activity/exercise interventions on reducing and maintaining lower cardiac risk factors and reducing secondary conditions. In addition, a need exists for well-designed (adequately powered prospective cohort) community-based studies targeting key health outcome(s) in all disability groups. Ideally, efforts to build an infrastructure for multi-center clinical exercise trials to reach low incidence populations would expand what is currently known. A remarkable gap exists in holistic, community-based educational approaches that address lifestyle choices leading to improved health outcomes. Interventions that demonstrate positive changes in health behaviors (i.e., increased physical activity) and persist over time would be valuable.

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There is growing support for the use of exercise/physical activity in improving various health outcomes in people with and without disabilities. Given the substantial health disparities noted in people with disabilities, there is a real and pressing need for broad-based efforts to effect change. This is important for many reasons, including reducing health care costs and reducing or eliminating secondary conditions that negatively impact health and may affect a person's ability to work, play, and enjoy life to the fullest extent possible.

Research recommendations: Continued efforts are needed for a common set of instruments for each targeted health outcome with good psychometric properties. Because of intra- and inter-individual variability within and between disability groups, categorizing subjects by function rather than disability may be a viable approach to building the evidence across multiple disability groups. We must be concerned with the complex interactions of biology, behavioral, and environmental determinants. Taylor, Baranowski and Young (1998) concluded in their review of 14 community-based studies from 1983-1997 that much work remains to develop effective interventions that include: 1) rigorous research designs; 2) theoretically-based interventions; and 3) validated assessment instruments to detect PA change over time. These recommendations are still current and are particularly important for building a stronger evidence base among people with disabilities.

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Please note up to three primary implications of your research, policy or training activity in each of the following areas:

IMPLICATIONS OF FINDINGS FOR

RESEARCH

1. While planned and structured physical activity interventions can improve physical fitness in people with disabilities, more research is needed to identify the long-term effects of a physically active lifestyle in reducing various health and secondary conditions.
2. More research is needed on the effects of physical activity on key health outcomes (i.e., bone mineral density, weight maintenance) and/or improved functional health changes.

POLICY

1. Efforts to build collaborative research teams across multiple sites will improve research efforts to gain a better understanding of the needs of low incidence populations.
2. Current evidence continues to highlight the need for prevention focused programs to increase positive health related behaviors and improve health for people with disabilities. Efforts are essential for early intervention and childhood focused programs.

TRAINING

- 1 There needs to be an expansion of academic programs to prepare professionals to provide physical activity programs to persons with disabilities. Too few programs have the academic expertise in the important departments of exercise science, public health, and/or human development and disability.
2. There is a particular lack of doctoral training programs to prepare new faculty in these related areas.

**Please Return to Susan Wingenfeld by April 30, 2008
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