

# Research Update

Practical, leading edge research results applied to physical activity for older adults, in plain language for health practitioners and leaders.  
Sponsored by the Active Living Coalition for Older Adults (ALCOA).

## Physical Activity and Mental Health

**"By Too Much Sitting Still the Body Becomes Unhealthy, and Then the Mind"** - Henry Wadsworth Longfellow

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ISBN 0-9685384-5-2

The physical benefits and eventual health outcomes of participation in physical activity for older adults are well known. These include, but are not limited to disease prevention, disability management, and improvement in health-related quality of life. Yet in 2006, we have only selective knowledge of the relationship between physical activity and its psychosocial benefits for older adults. There are ancient, historic reports that the healthy physical body goes hand in hand with a healthy mind. For instance, Hippocrates, identified as the father of medicine, advocated exercise for those with mental illness.

Today, our physical activity recommendations for older adults come from some of the most credible North American public health information sources – Health Canada and the U.S. Department of Health and Human Services. Readily available resources and action plans enable health care providers and fitness practitioners to help older adults with physical activity. Examples include Canada's Physical Activity Guide to Healthy Active Living for Older Adults and, in the United States, the National Blueprint on Physical Activity Among Older Adults. The update research resources concern older adults aged 60 through 90.

### Key points for health practitioners

- Multiple dimensions of psychosocial outcomes are associated with physical activity.
- Those most in need experience the greatest change in the psychosocial benefits of physical activity.
- The psychosocial outcomes following a single bout of physical activity can act as motivators.
- Psychosocial outcomes are not only influenced by physical activity but also by social factors like individual versus group participation, and by program leadership.

## Physical Activity and Depression and Anxiety

Among older adults, 15 % report depressive symptoms that increase with age. About the same number report anxiety disorders.

Symptoms of depression can include:

- feelings of worthlessness or guilt
- difficulty concentrating
- memory problems
- disturbed sleep
- changes in appetite
- fatigue and energy loss.

When depressive symptoms are chronic (nearly every day), older adults seem unable to find enjoyment in most aspects of

## Acknowledgements

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their lives. While this is not common, many other older adults go through temporary episodes of unhappiness.

Anxiety follows exposure to stress and is often accompanied by physiological arousal, (such as a racing heart and tense muscles), worry, and lack of concentration. Less chronic instances are called situational anxiety and involve people experiencing anxiety in certain situations. In these situations, a person might feel temporarily overwhelmed, experience some of the symptoms mentioned above, as well as feeling irritable, uncertain, and afraid. For example, an older adult who has not travelled recently may be unable to find their way in a busy airport and experience temporary feelings of anxiety.

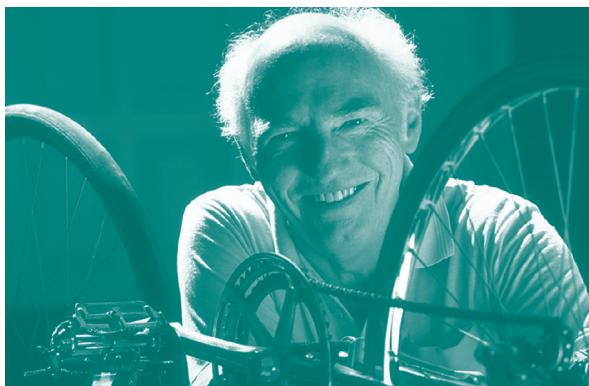
## The evidence for physical activity and depression and anxiety

Some of the strongest evidence for physical activity's psychosocial benefits concerns its effect on symptoms of depression and anxiety. A recent review of the evidence concluded that, as the amount of energy expended in weekly exercise increases, depressive symptoms decrease. Thus, the more older adults engage in 30 minutes of moderate activity most days of the week, the more likely those with anxiety symptoms will experience a decrease in those symptoms. These effects are more likely to occur when individuals stick with regular, weekly, moderate activity (i.e., 30 minutes daily) for several months. If seniors are mentally healthy (i.e., no severe or frequent symptoms of depression or anxiety), then obviously, the other physical function and positive psychosocial benefits should be observed.

## Which older adults show the greatest response?

For chronic disease, different people can show different responses. For example, in a major US study on seniors with knee

osteoarthritis, the seniors did either resistance (strength) or aerobic training over 18 months. They were compared to a control group and the exercising individuals who showed the most change in their depression symptoms were those who had the most severe and/or frequent symptoms at the start of the study. This was true regardless of the two types of exercise performed.



## Physical Activity and Cognitive Functioning

Among older adults not requiring specialized care, it is estimated that 25% have some form of cognitive impairment.

Cognitive impairment includes:

- deficits in memory
- poorer ability to manage thoughts, memories, and actions in order to do a specific task
- slower response and reaction time
- lower I.Q., math ability, and verbal ability

## The evidence for physical activity and cognitive functioning

The effect of physical activity on cognitive functioning has been frequently investigated among older adults. This is partly because of the known decline in central nervous system function with aging. Much of the literature concerns the effects of aerobic activity on different aspects of cognitive function. The strongest relationships are between physical participation and cognitive function. However, the relationship between physical fitness improvements and cognitive function

has been weak. We know that being regularly involved in activity has benefits, but we do not yet know if a certain level of fitness brings about a specific cognitive benefit, such as an improved I.Q.

## Which older adults show the greatest response?

A recent review of intervention studies conducted between 1966 and 2001 on adults aged 55 through 80 revealed that their performance of most cognitive tasks improved with exercise. For example, they improved at:

- tasks requiring speed
- remembering and redrawing a picture
- responding to certain cues while concurrently suppressing others.

The type of exercise producing the strongest effect was combined aerobic and resistance training. Further, exercise sessions of moderate intensity, such as walking for 35 to 45 minutes, appeared to have the strongest effects. Short sessions had the weakest effect. Older women had the greatest cognitive function response to exercise. Older adults aged 66–80 appeared to have the greatest improvement. Once again, the observation that those already experiencing some decline gain the most from activity may be applicable for cognitive function.

## Health-Related Quality of Life (HRQL) and Physical Activity

The World Health Organization has identified many components of a person's perception of their quality of life. Examples of these components include occupation, social relations, health, physical function, standard of living, and sexual functioning. Medical researchers have replaced the term "quality of life" with "health-related quality of life" (HRQL) or health status. These terms emphasize the medical interest in the functional effects of an illness on patients and the therapeutic effects of improving health status. HRQL and health status are umbrella terms for multiple outcomes. The most widely used and carefully

validated measure of global health status has both physical and mental health scales.

The physical health summary score includes:

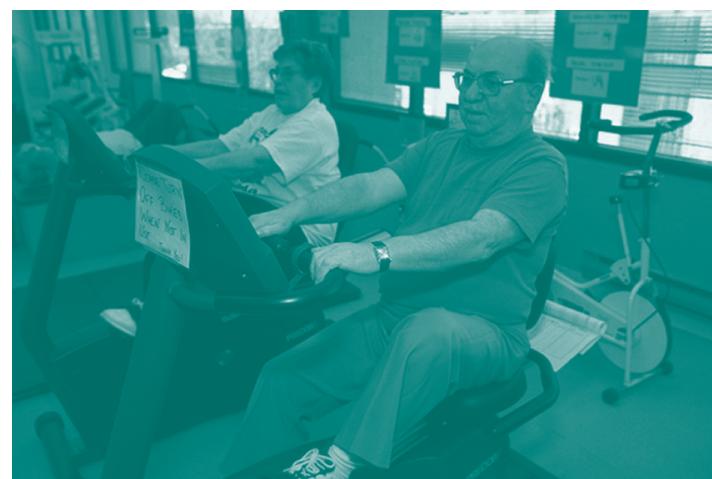
- physical function
- role-physical function
- bodily pain
- general health.

The mental health summary score includes:

- vitality
- role-emotional function
- social function
- emotional health.

Note that perception of personal health status plays a key role in how older adults rate their status. For example, some older adults may rate their physical health status as poor but have good emotional health. Others, who see themselves having poor physical health, may also suffer from poor mental health. It is not surprising that physical activity has its biggest impact when it improves the physical health status of frailest, older adults.

## The evidence for physical activity and



## HRQL

Several reviews of the HRQL and physical activity literature concern adults older than 60 years of age. Most studies were designed to improve fitness and/or physical performance with exercise prescriptions varying as a function of age, initial fitness, and disease status. Many of the studies reported a clear aerobic component to the training exercise that lasted at least 20 minutes. A number of studies

included resistance training as the prescription. Regardless of the design of studies, and whether older adults were healthy or diseased, physical activity generally had a positive effect on the physical function and mental health status (HRQL) of older adults.

It should be noted that the relationships observed are for physical activity involvement, not physical fitness. This is not surprising since HRQL concerns the older adults' perception of their functional status. They can clearly observe their own performance on physical functions that constitute activities of daily living, such as getting out of a chair, shopping for groceries, or walking up or down stairs. They can perceive their own functional exertion and success on these tasks. On the other hand, we shouldn't expect older adults to perceive outcomes of activities such as work capacity tests on a treadmill. Unless an exercise consultant explains their performance on such a test to seniors and makes the link to performance in activities of daily living and to health status, older adults do not use work capacity information in judging their HRQL.

## Which older adults show the greatest response?

The positive conclusions reported above do not mean that relationships between physical activity and HRQL have been detected for every facet of HRQL. The stronger relationships tend to be in evidence between performance-based measures of physical dysfunction and the physical function aspects of HRQL, such as bodily pain. As well, the size of the effect tends to be more pronounced among those who are less healthy and have more to gain by improvement in physical function. A less pronounced effect or no effect is observed on perceived function for the healthy older adult. Healthy seniors experience changes in other areas such as self-confidence.

A clear example of this effect of initial HRQL status was shown in a randomized clinical trial of older adults in cardiac rehabilitation. The trial used group motivation to encourage older adults to learn

behavior change skills so that they could independently manage changes in their physical activity lifestyles. Results from the 12 month study indicated that older adults in the group-motivated treatment had greater positive change in the mental health aspect of HRQL compared to people in the standard exercise rehabilitation treatment. However, those who had the lowest mental health scores at the study's onset experienced the greatest mental health changes. These results show that both self-management skills and initial levels of mental health influence the impact of physical activity.

## Physical Activity and Perceptions of



## Control

For most people, a sense of personal control is essential to their psychological and physical health. When older adults experience a decline in these aspects of health because of aging and lifestyle factors, the perceived and actual loss of control is a powerful psychological phenomenon. The most investigated form of control related to older adults' physical activity is self-efficacy - a form of specific self-confidence. Self-efficacy concerns the beliefs individuals have in their skills and abilities to carry out courses of action that produce desired outcomes. These beliefs are about abilities under specific

conditions, for example, confidence in one's ability to climb stairs without using a handrail, or to plan 30 minutes of physical activity into each day of the week. Self-efficacy beliefs can concern actual exercise or the ability to plan and adjust time to carry out any exercise program.

## The evidence for physical activity and self-efficacy

For both healthy older adults and those with chronic disease, self-efficacy beliefs have been shown to be related to their physical activity. In interventions among healthy seniors where sources of self-efficacy have been systematically varied, efficacy beliefs are correlated with adoption of and better adherence to physical activity. Among seniors with disease, efficacy beliefs have also been positively correlated with changes in cardiopulmonary function in heart attack patients, and with reduced pain in patients with knee osteoarthritis. Efficacy beliefs also predict the behaviour and performance of older adults who have mobility problems, balance difficulties, and are thus at risk for falls.

## Which older adults show the greatest response?

Strong relationships between self-efficacy and exercise have been observed in older adults with disease. In the study about cardiac rehabilitation, mentioned earlier, older adults who participated in the group-motivated treatment aspect of the study had a more positive change in their self-efficacy for walking as exercise. Moreover, the change in their self-efficacy to overcome activity barriers predicted change in physical activity and fitness.

For older adults in the cardiac rehabilitation study, there were gender differences. At study onset, men were 17% more confident in their efficacy beliefs for mobility. After three months of exercise therapy, men were still 9% more confident although both men and women had improved their self-efficacy. Gender differences in self-efficacy for mobility may

be unique to older adults when both disease and physical activity training influence mobility.

There are reports of gender differences among sedentary, but healthy older adults, and these are observed mainly at the start of exercise training. Studies report that men appear more confident or more in control of their physical ability than women. However, after moderate exercise training, both genders improved their efficacy and these differences disappeared.

## Are Psychosocial Benefits Caused Solely by Physical Activity?

The positive relationship between physical activity and certain psychosocial benefits is clear. However, studies also show that psychosocial outcomes are not caused by physical activity alone. For example, whether older adults participate in exercise planning versus a leader prescribing without allowing questions can have an impact. Also, exercising with a group versus alone has an influence. For older adults with physical disabilities, learning behavior change skills along with exercise training can improve involvement.

Older adults' choices of exercise setting, the leaders who help them, and the other exercise participants may all influence the activity behaviour of older adults (See Canada's Guide to Physical Activity for Older Adults – [www.paguide.com](http://www.paguide.com)).



*Funding for this publication was provided by Health Canada and the Public Health Agency of Canada.*

*The opinions expressed in this publication are of the author and do not necessarily reflect the official views of Health Canada and the Public Health Agency of Canada or of ALCOA.*

## Selected References / Références choisies

- American College of Sports Medicine. (1998). ACSM position stand on exercise and physical activity for older adults. *Medicine and Science in Sports and Exercise*, 30, 992-1008.
- Arent, S. M., Landers, D. M., & Etnier, J. L. (2000). The effects of exercise on mood in older adults: A meta-analytic review. *Journal of Aging and Physical Activity*, 8, 407-430.
- Blumenthal, J. A., & Gullette, E. C. (2002). Exercise interventions and aging: Psychological and physical health benefits in older adults. In W. K. Schaie, H. Leventhal, & S. L. Willis (Eds.), *Effective Health Behavior in Older Adults* (pp. 157-177). New York: Springer Publishing.
- Brawley, L.R., Rejeski, W.J., King, A.C. (2003). Promoting physical activity for older adults: The challenges for changing behavior. *American Journal of Preventive Medicine*, 25, 172-183.
- Carron, A. V., Hausenblas, H. A., & Estabrooks, P. A. (Eds.). (2002). *The Psychology of Physical Activity*. Toronto: McGraw Hill.
- Colcombe, S., & Kramer, A. F. (2003). Fitness effects on the cognitive function of older adults: A meta-analytic study. *Psychological Science*, 14, 125-130.
- Craft L. L., & Landers D. M. (1998). The effect of exercise on clinical depression and depression resulting from mental illness. *Journal of Sport and Exercise Psychology*, 20, 339-357.
- Dunn, A. L., Trivedi, M. H., & O'Neal, H. A. (2001). Physical activity dose-response effects on outcomes of depression and anxiety. *Medicine and Science in Sports and Exercise*, 33(Suppl. 6), 587-597.
- Etnier, J. L., Salazar, W., Landers, D. M., Petruzzello, S. J., Han, M., & Nowel, P. (1997). The influence of physical fitness and exercise upon cognitive functioning: A meta-analysis. *Journal of Sport and Exercise Psychology*, 19, 249-277.
- Focht, B.C., Brawley, L.R., Rejeski, W.J., Ambrosius,W.T. (2004). Group-mediated activity counseling and traditional exercise therapy programs: Effects upon health-related quality of life among older adults in cardiac rehabilitation. *Annals of Behavioral Medicine*, 28, 52-61.
- Hogan, M. (2005). Physical and cognitive activity and exercise for older adults: A review. *The International Journal of Aging and Human Development*, 60, 95-126.
- Martin-Ginis, K.A. Latimer, A.E., Brawley, L.R., Jung, M.E., & Hicks, A.L. (2006) Weight training to activities of daily living: Helping older adults make a connection. *Medicine and Science in Sports and Exercise*, 38, 116-121.

## Selected References / Références choisies

- Mazzeo, R. S., Cavanagh, P., Evans, W. J., Fiatarone, M., Hagberg, J., McAuley, et al. (1998). ACSM position stand: Exercise and physical activity for older adults. *Medicine and Science in Sports and Exercise*, 30, 992-1008.
- McAuley, E., & Katula, J.A. (1998). Physical activity interventions in the elderly: Influence of physical health and psychological function. In R. Schultz, G. Maddux, & M.P. Lawton (Eds.), *Annual Review of Gerontology and Geriatrics* (pp. 111-154). New York: Springer.
- McAuley, E., & Rudolph, D. (1995). Physical activity, aging, and psychological well-being. *Journal of Aging and Activity*, 3, 67-96.
- Netz, Y., Wu, M., Becker, B. J., & Tenenbaum, G. (2005). Physical activity and psychological well-being in advanced age: A meta-analysis of intervention studies. *Psychology and Aging*, 20, 272-284.
- North, T. C., McCullagh, P., & Tran, Z. V. (1990). Effect of exercise on depression. *Exercise and Sport Science Reviews*, 18, 379-415.
- Penninx BWJH, Rejeski, WJ, Pandya J, Miller ME, Di Bari M, Applegate WB, Pahor M. (2002). Exercise and depressive symptoms: a comparison of aerobic and resistance exercise effects on emotional and physical function in older persons with high and low depressive symptomatology. *Journals of Gerontology: Psychological Sciences*. 57B: P124-P132.
- Rejeski, W.J. & Brawley, L.R. (2006) Functional health: Recent innovations in research on physical activity with older adults. *Medicine and Science in Sports and Exercise*, 38, 93-99.
- Rejeski, W. J., Brawley, L. R., & Shumaker, S. A. (1996). Physical activity and health-related quality of life. *Exercise and Sport Sciences Reviews*, 24, 71-108.
- Rejeski ,WJ, Focht, BC, Messier, SP, Morgan, T, Pahor, M, Penninx, B.( 2002). Obese, older adults with knee osteoarthritis: Weight loss, exercise, and quality of life. *Health Psychology*. 21, 419-426.
- Rejeski, W. J., & Mihalko, S. L. (2001). Physical activity and quality of life in older adults. *Journals of Gerontology*, 56A, s23-s25.