

Understanding Physical Fitness In Older Populations

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Abstract: Physical Activity has been defined as “any bodily movement produced by skeletal muscles that results in energy expenditure. Exercise which was defined as “Leisure time physical activity which is planned and structured, repetitive bodily movement undertaken to improve or maintain one or more components of physical fitness. Physical fitness is the ability of an individual to carry out physical activities without undue fatigue at the end of the exercise. Low physical activity are associated with an increased risk of developing chronic health conditions in people over the age of 65 years.

Each year at least 1.9 million people die as a result of physical inactivity. More than 35 million people died of NCDs in 2005 - this represented 60% of all deaths worldwide.

80% of deaths from NCDs occur in low- and middle-income countries.

Without action to address the causes, deaths from NCDs will increase by 17% between 2005 and 2015. components of physical fitness includes cardiorespiratory endurance, muscle strength, muscle endurance, flexibility and body composition.

Metabolic equivalent MET is used to measure the metabolic cost of an exercise. One MET represents the body's resting metabolic rate. Exercise intensity is expressed in multiples of resting metabolic rate. For example, an exercise intensity of 2 METs is 2 times the resting metabolic rate. METs are used to describe exercise intensities for occupational activities and exercise programs. Bicycling at a leisurely pace of 5.5 mph has a MET value of 3.5 and washing dishes has a MET value of 1.8.

Physical activity measurement in the elderly in the elderly is measured by Perceived rate of exertion; It is scaled from 0–10 with 5–6 being moderate-intensity exercise and 7–8 being vigorous-intensity exercise. Pedometers and accelerometers; Pedometers are low-cost mechanical counters that determine the number of steps a person takes throughout the day by detecting vertical motion during walking.

Accelerometers measure accelerations in one or more planes of motion and can give an indication of the frequency, intensity and duration of different types of movement. Eg an older adult achieving 10 000 or more daily steps is categorised as highly active, over 5000 but less than 10 000 as moderately active, and 5000 steps or below as inactive.

‘Move for health’ by WHO’s world health initiative stated that:

✓ Low levels of physical activity are associated with an increased risk of mortality in people over the age of 65 years.

✓ Low levels of physical activity are associated with an increased risk of developing chronic health conditions in people over the age of 65 years.

✓ Each year at least 1.9 million people die as a result of physical inactivity.

- ✓ At least 30 minutes of regular, moderate-intensity physical activity on 5 days per week reduces the risk of several non-communicable diseases (NCDs).
- ✓ Physical inactivity is an independent modifiable risk factor for common NCDs.
- ✓ More than 35 million people died of NCDs in 2005 - this represented 60% of all deaths worldwide.
- ✓ 80% of deaths from NCDs occur in low- and middle-income countries.
- ✓ Without action to address the causes, deaths from NCDs will increase by 17% between 2005 and 2015

WHAT IS PHYSICAL ACTIVITY AND WHAT IS EXERCISE?

- ✓ Physical Activity has been defined as “any bodily movement produced by skeletal muscles that results in energy expenditure.
- ✓ exercise which was defined as “Leisure time physical activity which is planned and structured,
- ✓ repetitive bodily movement undertaken to improve or maintain one or more components of physical fitness.

SEDENTARY LIFESTYLE IN THE ELDERLY

- ✓ Sedentary lifestyle("sitting disease") is a type of lifestyle in which a person has no regular physical activity. Many older people and retirees are often sedentary due to pain and reduced mobility from conditions like arthritis. Eg
- ✓ Having an occupation that involves very less or no physical activity
- ✓ eating or drinking (socially or alone)
- ✓ watching TV, sports, or films
- ✓ reading
- ✓ sleeping or napping
- ✓ engaging in non-athletic hobbies (knitting, doing puzzles)

HEALTH RISKS OF A SEDENTARY LIFESTYLE

- ✓ *Back, neck pain, and repetitive stress syndromes.* Lumbar and cervical pain and posture issues from sitting and looking at computer screens is extremely common. In fact, back pain and repetitive stress are the major causes of disability and absenteeism from work
- ✓ *Cancer.* Being sedentary has been associated with certain types of cancers, including breast cancer and colon cancer.
- ✓ *Cardiovascular disease.* One study recently indicated that for every hour you spend sitting in front of a television or a screen, your risk of death from cardiovascular disease may increase by 18%. Also, sitting too long has been shown to increase blood pressure in children and adults
- ✓ *Clots and strokes.* Pulmonary embolism (clot) that begin as deep vein thrombosis can lead to death in people who are chronically inactive, especially in the elderly
- ✓ *Cognitive decline and dementia.* Some studies have linked a sedentary lifestyle to an increased risk of cognitive decline

- ✓ *Depression and mental illness.* Excessive screen time and television watching have been linked to notable increases in psychological distress and depression
- ✓ *Diabetes Type 2.* Studies have indicated that people who sit and watch TV more than two hours per day have up to a 20% increased risk of developing diabetes.
- ✓ *Inflammation.* Lack of activity may worsen inflammatory responses in the elderly.
- ✓ *Metabolic syndrome.* Most often associated with obesity (high BMI and large waist circumference), this syndrome also includes two of the following: high blood pressure, elevated triglyceride level, low high density lipoprotein (HDL) cholesterol level, and higher than normal fasting plasma glucose. Men and women who sit more have up to a 73% greater chance of developing metabolic syndrome as opposed to those who are more active.
- ✓ *Muscle degeneration.* Not exercising can lead to muscle weakness, atrophy, and poor grip strength in the elderly.
- ✓ *Obesity.* Too little activity can lead to excessive weight gain in the elderly.
- ✓ *Osteoporosis;* older people who've already begun to lose bone density, may find the process speeding up as a result of their sedentary lifestyle

COMPONENTS OF PHYSICAL FITNESS:

- ✓ cardiorespiratory endurance
- ✓ muscle strength
- ✓ muscle endurance
- ✓ flexibility and
- ✓ body composition

CARDIO RESPIRATORY ENDURANCE (CRE)

- ✓ Cardio respiratory Fitness/ cardiorespiratory Endurance (CRE) is the ability of the respiratory and circulatory system to effectively deliver oxygen to the heart and working muscles during exercises.
- ✓ It can also be defined as the ability of the body to work continuously for an extended period of time.
- ✓ Related to the ability to perform large muscle, dynamic moderate to high intensity exercise for prolonged period.
- ✓ A key health-related component of fitness .
- ✓ Achieved with aerobics exercises eg. Running, jogging, swimming, cycling etc.

BENEFITS OF CRE IN THE ELDERLY

- ✓ Improved Cardio respiratory Functioning
- ✓ Improved Cellular Metabolism
- ✓ Reduced Risk of Chronic Disease
- ✓ Better Control of Body Fat
- ✓ Improved Immune Function
- ✓ Improved Psychological and Emotional Well-Being
- ✓ Reduces ageing

MUSCLE STRENGTH AND ENDURANCE IN THE ELDERLY

- ✓ Muscle strength is defined as the amount of force a muscle or group of muscles can exert with a single maximum effort.
- ✓ Muscle endurance is the ability of a muscle or group of muscle to exert force against a resistance or to sustain a muscle contraction for a given period of time.

BENEFITS OF MUSCLE STRENGTH AND MUSCLE ENDURANCE IN THE ELDERLY

- ✓ Useful for everyday task as lifting etc
- ✓ Participation in everyday activity with minimal effort
- ✓ Improve physical performance (in sports and physical activity)
- ✓ Protection from injury
- ✓ Increased metabolic rate
- ✓ Maintenance of bone mineral density
- ✓ Improve body image
- ✓ Prevention and management of chronic disease

FLEXIBILITY IN THE ELDERLY

- ✓ Flexibility is the ability for joints to move through a range of motion,
- ✓ It is an important component of physical fitness.
- ✓ Good flexibility can improve ones performance in sports and other activities,
- ✓ it can reduce risk of injury.
- ✓ Flexibility can be improved by regularly stretching or moving the joints through their full range of motion.

BODY FAT COMPOSITION IN THE ELDERLY

- ✓ Body fat composition refers to the amount of adipose tissue present in the body.

TO QUALIFY AS FIT:

- ✓ Men must have a body fat composition lower than 17 percent
- ✓ Women must have a body fat composition lower than 24 percent
- ✓ The average man tends to have about 18 to 24 percent body fat, while the average woman has 25 to 31 percent body fat

FACTORS MILITATING PHYSICAL ACTIVITY IN THE ELDERLY

- ✓ Environmental factors
- ✓ Cultural factors
- ✓ Past and present medical history
- ✓ Social factors/ social integration
- ✓ Psychological factors/ emotions
- ✓ *Environmental factors*; provision of good access to shops and services, well-maintained walking facilities,

aesthetically appealing places, streets with little traffic and places for social interaction.

- ✓ environment should evoke feelings of familiarity and safety from crime.
- ✓ *Cultural factors*; in our culture, some title may prevent the elderly from engaging in PA.
- ✓ *Past and present medical history*; the previous or present health condition of an elderly might restrict them from participating in PA.
- ✓ *Social factors/ social integration*; I am too old, I can not partake in some activities cos by bones are failing me. I need to go to the village to rest my bones.
- ✓ *Psychological factors/ emotions*; then fear of past injury or fall might prevent an elderly from participating in PA.

BENEFICIAL EFFECTS OF EXERCISE ON THE HEALTH OF OLDER ADULTS INCLUDE:

- ✓ Reduced risk of developing coronary heart disease, stroke, certain types of cancers and diabetes
- ✓ Prevention of post-menopausal osteoporosis and protection against osteoporotic fractures by reducing the risk of falls
- ✓ A reduction in accidental falls.
- ✓ A reduction in loneliness and isolation, along with a reduction in depression
- ✓ A reduction in the complications of immobility, such as deep vein thrombosis and pressure sores.
- ✓ Physical activity has also been shown to improve mental health and cognitive function in older adults

WHAT TYPE OF EXERCISE IS RECOMMENDED AS APPROPRIATE FOR OLDER ADULTS?

This depends upon the ability of the person

- ✓ Activities that maintain or increase flexibility are recommended.
- ✓ Balance exercises are recommended for older adults at risk of falls.
- ✓ Exercises of reduced intensity such as jogging
- ✓ Isokinetic exercises
- ✓ Resistance exercises
- ✓ Water bath

MEASUREMENT OF PHYSICAL ACTIVITY IN THE ELDERLY

- ✓ Metabolic equivalent MET
- ✓ Scientists use METs to measure the metabolic cost of an exercise. One MET represents the body's resting metabolic rate.
- ✓ Exercise intensity is expressed in multiples of resting metabolic rate.
- ✓ For example, an exercise intensity of 2 METs is 2 times the resting metabolic rate.
- ✓ METs are used to describe exercise intensities for occupational activities and exercise programs.
- ✓ bicycling at a leisurely pace of 5.5 mph has a MET value of 3.5 and washing dishes has a MET value of 1.8.

MET Table

Activity	METs	Caloric Expenditure (kilocalories/min)
Rest	1	1.2
Light housework	2-4	2.4-4.8
Bowling	2-4	2.5-5
Walking	2-7	2.5-8.5
Archery	3-4	3.7-5
Dancing	3-7	3.7-8.5
Hiking	3-7	3.7-8.5
Horseback riding	3-8	3.7-10
Cycling	3-8	3.7-10
Basketball (recreational)	3-9	3.7-11
Swimming	4-8	5-10
Tennis	4-9	5-11
Fishing (fly, stream)	5-6	6-7.5
In-line skating	5-8	6-10
Skiing (downhill)	5-8	6-10
Rock climbing	5-10	6-12
Scuba diving	5-10	6-12
Skiing (cross-country)	6-12	7.5-15
Jogging	8-12	10-15

NOTE: Intensity varies greatly with effort, skill, and motivation.
SOURCE: Adapted from American College of Sports Medicine. 2006. ACSM's Guidelines for Exercise Testing and Prescription, 7th ed. Philadelphia: Lippincott Williams and Wilkins.

Table 1

MEASUREMENT OF PHYSICAL ACTIVITY IN THE ELDERLY

- ✓ Perceived rate of exertion; It is scaled from 0–10 with 5–6 being moderate-intensity exercise and 7–8 being vigorous-intensity exercise
- ✓ Pedometers and accelerometers; Pedometers are low-cost mechanical counters that determine the number of steps a person takes throughout the day by detecting vertical motion during walking.
- ✓ Accelerometers measure accelerations in one or more planes of motion and can give an indication of the frequency, intensity and duration of different types of movement. Eg an older adult achieving 10 000 or more daily steps is categorised as highly active, over 5000 but less than 10 000 as moderately active, and 5000 steps or below as inactive.
- ✓ *types of physical activity and exercise for the elderly*
- ✓ *Strength and aerobic fitness*; a type of PA that recruit group of muscles during exercise and requires oxygen consumption.
- ✓ *Balance exercises*; help to reduce risk of fall
- ✓ *Incidental physical activity*; Incidental physical activity is that which occurs throughout the course of the day during activities of daily living. It is generally of low intensity but often contains some sporadic bouts of moderate intensity activity.

RECOMMENDED LEVELS OF PHYSICAL ACTIVITY FOR OLDER ADULTS BY WHO

- ✓ At least 150 min of moderate-intensity aerobic activity, or at least 75 min of vigorous-intensity aerobic activity, or an equivalent combination.

- ✓ Aerobic activity should be performed in bouts of at least 10 min duration.
- ✓ For additional health benefits, undertake up to 300 min of moderate-intensity or 150 min of vigorous-intensity aerobic activity, or an equivalent combination.
- ✓ People with poor mobility should do balance exercise to prevent falls on 3 or more days.
- ✓ Muscle-strengthening activities should be done on two or more days.
- ✓ If older adults are unable to do the recommended amounts of physical activity due to health conditions, they should be as physically active as they are able.

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