



P-ISSN: 2394-1685  
E-ISSN: 2394-1693  
Impact Factor (ISRA): 5.38  
IJPESH 2021; 8(3): 217-222  
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[www.kheljournal.com](http://www.kheljournal.com)  
Received: 07-03-2021  
Accepted: 09-04-2021

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## Importance of physical activity and home-based exercise during the COVID-19 pandemic

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### Abstract

Physical activity and exercise can be effective treatment strategies for symptoms of both depression and anxiety. Each day is a new opportunity to engage in physical activity and exercise that can bring short and long-term benefits for mood, sleep, and physical health. The novel coronavirus disease 2019 (COVID-19) seems to be having a major impact on physical activity behaviours globally. The pandemic has forced many people around the world to stay at home and self-isolate for a period of time. WHO recommends 60 min/day of moderate-to-vigorous physical activity for 6-17-yr-olds, and 75 min/wk of vigorous or 150 min/wk of moderate physical activity for adults and elderly, including 3 and 2 days/wk, respectively, with muscle and bone strengthening Practical recommendations for staying active at home, with aerobic exercise training on a bike or rowing ergometer, bodyweight training, dance and active video gaming, can aid to counteract the detrimental physical and mental side-effects of the COVID-19 protective lifestyle regulations. This commentary provides useful information on home-based physical activity for sedentary people across the lifespan, including children and adolescence, that can be undertaken during the present pandemic or other outbreaks of infectious disease. Home-based activities provide an opportunity for people to stay fit and healthy by practising simple movements while staying at home.

**Keywords:** physical activity, COVID-19, exercise, physical inactivity and pandemic, home-based exercise

### Introduction

The COVID-19 pandemic is an unprecedented time all across the world. Worldwide, extensive social distancing policies are put into place, restricting people's daily activities and worldwide pleas from governments asking people to stay safe and stay at home. This of course means that most people will spend much of their time (if not all) at home.

These social distancing measures mean that people have far fewer opportunities to be physically active, especially if activities such as walking or cycling as transportation, or taking part in a leisurely activity (e.g. jogging, walking the dog, going to the gym) are being restricted. Furthermore, these drastic measures also make it so much easier to be sedentary at home for long periods of time. The impact of this physical inactivity may very likely be seen in many areas such as health and social care and the mental well-being of people all across the globe.

Although these social distancing measures are important and needed in a time such as now, our bodies and minds still need physical activity and the many benefits thereof.

### Definition of physical activity

Physical Activity (PA) is defined as any bodily movement produced by skeletal muscles that require energy expenditure. There are two components to physical activity that need to be considered:

- Aerobic fitness: This usually includes moderate to vigorous activity that makes you feel a bit warm and causes an increase in your breathing rate, breathing depth and your heart rate.
- Strength and balance: This is often the forgotten component of physical activity but it is an essential part and has many benefits.

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**Physical activity may include**

- Active recreation
- Sports participation
- Cycling
- Walking
- Play
- Dance
- Gardening
- House cleaning
- Carrying heavy shopping

During the COVID-19 pandemic it is even more important for all people to be physically active. Even if it is only a short break from sitting at your desk and doing some walking or stretching. Doing something as simple as this will:

- Ease Muscle Strain
- Relief Mental Tension
- Improve Blood Circulation
- Improve Muscle Activity
- Create Some Routine to Your Day in These Unprecedented Times.

**The importance of physical activity during the COVID-19 pandemic**

In light of the current situation worldwide, certain benefits of physical activity may be specifically pertinent to the COVID-19 Pandemic. These benefits are:

- Physical activity enhances immune function and reduces inflammation therefore it could reduce the severity of infections.
- Physical activity improves common chronic conditions that increase the risk for severe COVID-19 (i.e. Cardiovascular Disease, Diabetes).
- Physical activity is a great stress management tool by reducing symptoms of anxiety and depression.
- Physical activity helps bring cortisol levels in balance. Stress and distress (such as during a pandemic) creates an imbalance in cortisol levels and this negatively influences immune function and inflammation.

**How to stay safe while exercising during COVID-19**

- Do not exercise if you have a fever, cough or difficulty breathing (symptoms of COVID-19).
- Practise social distancing when exercising outdoors and practice good hand hygiene before and after.
- If you are not used to physical activity, start slowly with low intensity activities such as walking or low impact exercises for shorter periods of time and gradually build up over time.
- Choose the right activity to reduce the risk of injury; the intensity of the exercise should match your fitness levels and health status.

The benefits of physical activity and exercise have been demonstrated across the lifespan. We are meant to move and many of our body's systems work better when we are consistently physically active.

For managing symptoms of depression, some research suggests that elevated levels of aerobic activity (exercise that significantly raises our heart rates) may be associated with greater reductions in depressive symptoms. Consider engaging in physical activity once or twice daily that includes brief periods (30-90 seconds) of greater intensity. For some, this might be accomplished through exercise in their homes including jumping jacks, mountain climbers, and sequencing

strength training exercises (i.e. standing squats, push-ups, sit-ups). For others, the use of home exercise equipment such as treadmills, elliptical machines, and stationary bikes may be helpful.

Strength-training has been shown to reduce symptoms of anxiety for individuals with and without an anxiety disorder. Weightlifting using exercise equipment or household items (textbooks, canned goods, milk jugs filled with water, paint cans) may help us to reduce the negative effects of stress and anxiety.

For children and adolescents, moderate-to-vigorous physical activity and exercise during the day are associated with elevations in self-esteem, improved concentration, reductions in depressive symptoms, and improvements in sleep.

For older adults and among individuals managing chronic medical conditions, regular walks are recommended. The benefits of strength training and weightlifting (low weight with high numbers of repetitions) may be even greater in older adults to maintain quality of life and functioning.

Moderate-to-vigorous physical activity (such as speed-walking or jogging) has been shown to help reduce the use of alcohol and other substances. Additionally, participation in regular physical activity is shown to boost the immune system. Reduction in substance use is also associated with improvement in the body's ability to fight off infection.

Many companies are offering free use of their on-line platforms that may help to identify a variety of in-home activities (indoor cycling, treadmill running, dance cardio, yoga, strength training, and more) to help make exercise more enjoyable during this critical period. We strongly support the idea of on-going vigilance regarding physical-distancing and limitations on in-person contacts as guided by the Centres for Disease Control and Prevention.

We recommend finding physical activities that you enjoy and to share your experience with others. At the same time, there is also evidence to suggest that exercise can be helpful to mood even if the act of doing the exercise is not as enjoyable. It is important for family members to take a supportive role in the promotion of physical activity and exercise. Allowing individuals to maintain their autonomy and choice in their activities will be important for on-going engagement.

We are all managing additional stress related to the growth of the COVID-19 pandemic and it's potential to threaten the health of ourselves, our families, and our communities. Please consider using physical activity and exercise as a strategy to maintain health during this stressful period.

Although many things feel beyond our control right now, we do have the ability to be creative and to build physical activity and exercise into each of our days. We may even look back on this difficult time as the turning point when we learned new ways to build our emotional resilience and our physical health.

The COVID-19 pandemic means that many of us are staying at home and sitting down more than we usually do. It's hard for a lot of us to do the sort of exercise we normally do. It's even harder for people who don't usually do a lot of physical exercise.

But at a time like this, it's very important for people of all ages and abilities to be as active as possible. WHO's Be Active campaign aims to help you do just that - and to have some fun at the same time.

Remember - Just taking a short break from sitting, by doing 3-4 minutes of light intensity physical movement, such as walking or stretching, will help ease your muscles and

improve blood circulation and muscle activity.

Regular physical activity benefits both the body and mind. It can reduce high blood pressure, help manage weight and reduce the risk of heart disease, stroke, type 2 diabetes, and various cancers - all conditions that can increase susceptibility to COVID-19.

It also improves bone and muscle strength and increases balance, flexibility and fitness. For older people, activities that improve balance help to prevent falls and injuries.

Regular physical activity can help give our days a routine and be a way to stay in contact with family and friends. It's also good for our mental health - reducing the risk of depression, cognitive decline and delay the onset of dementia - and improve overall feelings

### **How much physical activity is recommended for your age group?**

WHO has recommendations on the amount of physical activity people of all ages should do to benefit their health and wellbeing.

#### **Infants under 1 year of age**

- All infants should be physically active several times a day.
- For those not yet mobile, this includes at least 30 minutes in prone position (tummy time), as floor-based play, spread throughout the day while awake.

#### **Children under 5 years of age**

- All young children should spend at least 180 minutes a day in a variety of types of physical activities at any intensity
- 3-4-year-old children should spend at least 60 minutes of this time in moderate- to vigorous-intensity physical activity

#### **Children and adolescents aged 5-17 years**

- All children and adolescents should do at least 60 minutes a day of moderate to vigorous-intensity physical activity
- This should include activities that strengthen muscle and bone, at least 3 days per week
- Doing more than 60 minutes of physical activity daily will provide additional health benefits

#### **Adults aged over 18 years**

- All adults should do at least 150 minutes of moderate-intensity physical activity throughout the week, or at least 75 minutes of vigorous-intensity physical activity throughout the week.
- For additional health benefits, adults should increase their moderate-intensity physical activity to 300 minutes per week, or equivalent.
- For developing and maintaining musculoskeletal health, muscle-strengthening activities involving major muscle groups should be done on 2 or more days a week
- In addition, older adults with poor mobility should do physical activity to enhance balance and prevent falls on 3 or more days per week.

### **Stay physically active during self-quarantine**

As new COVID-19 cases continue to emerge in the WHO, many healthy individuals are being requested to stay at home in self-quarantine. In some countries, fitness centres and other locations where individuals are normally active, will remain

temporarily closed. Staying at home for prolonged periods of time can pose a significant challenge for remaining physically active. Sedentary behaviour and low levels of physical activity can have negative effects on the health, well-being and quality of life of individuals. Self-quarantine can also cause additional stress and challenge the mental health of citizens. Physical activity and relaxation techniques can be valuable tools to help you remain calm and continue to protect your health during this time.

WHO recommends 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity physical activity per week, or a combination of both. These recommendations can still be achieved even at home, with no special equipment and with limited space. The following are some tips on how to stay active and reduce sedentary behaviour while at home in self-quarantine:

#### **Take short active breaks during the day**

Short bouts of physical activity add up to the weekly recommendations. You may use the suggested exercises below as inspiration to be active every day. Dancing, playing with children, and performing domestic chores such as cleaning and gardening are other means to stay active at home.

#### **Follow an online exercise class**

Take advantage of the wealth of online exercise classes. Many of these are free and can be found on YouTube. If you have no experience performing these exercises, be cautious and aware of your own limitations.

#### **Walk**

Even in small spaces, walking around or walking on the spot, can help you remain active. If you have a call, stand or walk around your home while you speak, instead of sitting down. If you decide to go outside to walk or exercise, be sure to maintain at least a 1-meter distance from other people.

#### **Stand up**

Reduce your sedentary time by standing up whenever possible. Ideally, aim to interrupt sitting and reclining time every 30 minutes. Consider setting up a standing desk by using a high table or stacking a pile of books or other materials, to continue working while standing. During sedentary leisure time prioritize cognitively stimulating activities, such as reading, board games, and puzzles.

#### **Relax**

Meditation and deep breaths can help you remain calm. A few examples of relaxation techniques are available below for inspiration.

For optimal health, it is also important to remember to eat healthily and stay hydrated. WHO recommends drinking water instead of sugar-sweetened beverages. Limit or avoid alcoholic beverages for adults and strictly avoid these in young people, and pregnant and breastfeeding women, or for other health reasons. Ensure plenty of fruits and vegetables, and limit the intake of salt, sugar and fat. Prefer whole grains rather than refined foods. For more guidance on how to eat healthily during self-quarantine, please see the Food and nutrition tips during self-quarantine, prepared by WHO/Europe.

#### **Examples of home-based exercises**

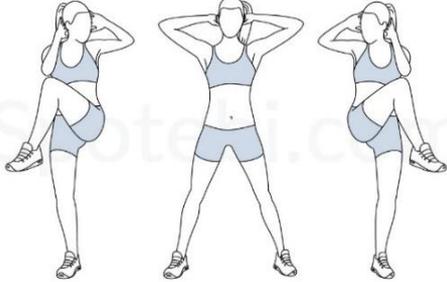
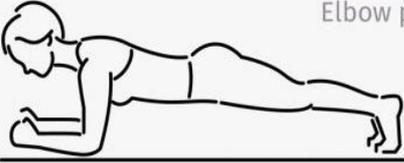
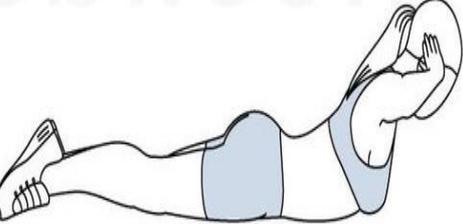
Home-based activities provide an opportunity for people to

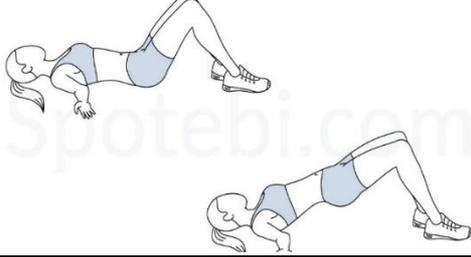
stay fit and healthy by practising simple movements while staying at home. Many countries have now implemented lockdowns, forcing people to stay at home and only go out in the event of an emergency. These decisions will affect peoples' mental and physical health, especially those who are used to regular outdoor physical activities. We are all aware of the importance of our mental health and the need to improve our immune system, which is extremely important for fighting sickness. Staying at home can lead to a lot of stress, anxiety and mental distress. The best way to overcome

these problems is to replace outdoors activities with home-based activities, such as bodyweight training and dance-based aerobic exercise, and if possible, aerobic high-intensity exercise using stationary bikes or rowing ergometers, also with self-paced protocols. These activities can be combined with, but not substituted by, stretching and active gaming.

To support individuals in staying physically active while at home, WHO has prepared a set of examples of home-based exercises.

**Table 1:** WHO has prepared a set of examples of home-based exercises.

<p><b>Knee to elbow</b> Touch one knee with the opposite elbow, alternating sides. Find your own pace. Try to perform this for 1-2 minutes, rest for 30-60 seconds, and repeat up to 5 times. This exercise should increase your heart and breathing rates.</p>	
<p><b>Plank</b> Support your forearms firmly on the ground, with the elbows under the shoulders. Keep the hips at the level of the head. Hold for 20-30 seconds (or more, if possible), rest for 30-60 seconds, and repeat up to 5 times. This exercise strengthens your belly, arms and legs.</p>	
<p><b>Back extensions</b> Touch your ears with your fingertips and lift your upper body, keeping the legs on the ground. Lower the upper body again. Perform this exercise 10-15 times (or more), rest for 30-60 seconds, and repeat up to 5 times. This exercise strengthens your back muscles.</p>	
<p><b>Squats</b> Place your feet at hip distance with the toes pointing slightly outwards. Bend the knees as much as feels comfortable, keeping the heels on the ground and the knees over (not in front of) the feet. Bend and stretch the legs. Perform this exercise 10-15 times (or more), rest for 30-60 seconds, and repeat up to 5 times. This exercise strengthens your legs and glutes.</p>	
<p><b>Side knee lifts</b> Touch your knee with your elbow, lifting the knee to the side, alternating sides. Find your own pace. Try to perform this for 1-2 minutes, rest for 30-60 seconds, and repeat up to 5 times. This exercise should increase your heart and breathing rates.</p>	

<p><b>Superman</b> Place your hands under your shoulders and knees under your hips. Lift one arm forward and the opposite leg back, alternating sides. Perform this exercise 20-30 times (or more), rest for 30-60 seconds, and repeat up to 5 times. This exercise strengthens your belly, glutes and back muscles.</p>	
<p><b>Bridge</b> Plant your feet firmly on the ground with the knees over the heels. Lift the hips as much as it feels comfortable and slowly lower them again. Perform this exercise 10-15 times (or more), rest for 30-60 seconds, and repeat up to 5 times. This exercise strengthens your glutes.</p>	
<p><b>Chair dips</b> Hold onto the seat of a chair, with your feet about half a meter away from the chair. Bend your arms as you lower your hips to the ground, then straighten the arms. Perform this exercise 10-15 times (or more), rest for 30-60 seconds, and repeat up to 5 times. This exercise strengthens your triceps.</p>	
<p><b>Chest opener</b> Interlace your fingers behind your back. Stretch your arms and open your chest forward. Hold this position for 20-30 seconds (or more). This position stretches your chest and shoulders.</p>	
<p><b>Child's pose</b> With the knees on the ground, bring your hips to your heels. Rest your belly on your thighs and actively stretch your arms forward. Breathe normally. Hold this position for 20-30 seconds (or more). This position stretches your back, shoulders and sides of the body.</p>	
<p><b>Legs up the wall</b> Bring your hips close (5-10 cm) to the wall and let your legs rest. Close your eyes, relax your body and progressively deepen your breathing. Concentrate on your breath, trying not to focus on any thought or concern. Rest in this pose for up to 5 minutes. This position is meant to be comfortable, relaxing and de-stressing.</p>	

**Seated meditation**

Sit comfortably on the floor with your legs crossed (alternatively, sit on a chair). Make sure your back is straight. Close your eyes, relax your body and progressively deepen your breathing. Concentrate on your breath, trying not to focus on any thoughts or concerns. Remain in this position for 5-10 minutes or more, to relax and clear your mind.

**Conclusion**

Normally, home-based and regular physical exercise program can provide an opportunity for people to stay physically healthy by practicing simple movements with low-moderate to high intensity in the time of staying at home. The best way to overcome COVID-19 associated problems is to substitute outdoor regular exercise program with home-based/individualized/regular exercise program, such as bodyweight training and dance-based aerobic exercise, and if possible, aerobic high-intensity exercise using different machines, also with self-paced protocols. These physical exercises can be combined with, but not substituted by, stretching and active gaming. The great importance of a healthy diet during this pandemic period also should give more attention. Generally, maintaining a regular physical activity raining, carefully in a park setting or safely at home, is a helpful strategy to reduce the consequences of this pandemic, both at the physical and mental level. The time spent at home could therefore be changed into by participating mostly in home based aerobic exercise to build a positive and mindful relationship with the long-term health benefits of exercising.

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