7 (2) (2020) 31 - 37

Journal of Physical Education, Health and Sport

http://journal.unnes.ac.id/nju/index.php/jpehs

Simple Exercises at Home During Social Distancing to Avoid Covid-19

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History Article

Received 02 November 2020
Approved November 2020
Published November 2020

Keywords

Physical Excercise; Immune System; Covid-19; Social Distancing

Abstract

This study aims to examine several exercises that can be done at home during the Covid 19 pandemic or when practicing social distancing. Material and methods: This study implements descriptive methods to examine various possible exercises to do at home. The exercises discussed in this study are easy to do but full of benefits. In addition, these exercises also do not require special equipment available in gyms. Result: The kinds of exercises discussed in this article include: (1) cardiovascular exercises that aim to improve cardiovascular (heart and blood vessel) fitness and lungs' respiratory capacity and (2) exercises to strengthen muscles and bones, which aim to promote bone and muscle strengths in order to facilitate us doing activities without any motion problems. Conclusion: there are at least thirteen types of exercises that can be adopted as home-based alternatives of exercises without partner or special equipment. As has been mentioned, these exercises are improving cardiovascular fitness and muscular strength. Doing medium-intensity exercises routinely will improve immune system.

How to Cite

Fauzi, R. A., Suherman, A., Indra Safari, Saptani, E., (2020). Simple Exercises at Home During Social Distancing to Avoid Covid-19. *Journal of Physical Education, Health and Sport*, 7 (2), 31-37.

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p-ISSN 2354-7901
e-ISSN 2354-8231

INTRODUCTION

In early 2020, the world was shaken by the spread of a virus called Corona, which later is known as Corona Virus Disease 2019 (COVID-19). It is believed that this virus originates from an area in Wuhan, China and disseminates all over the globe. COVID-19 is a pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that affects patient's lower respiratory tract with pneumonia.

Six months since the first case of COVID-19 appeared. There has been no vaccine found to cure or prevent the spread of COVID-19, resulting in failure to stop the dissemination of this virus completely. One of the ways believed to be effective to prevent COVID-19 is by improving immune system so that one can fight the virus if it enters one's body.

Strong immune system is a good defender against COVID-19 virus. Regular exercise is a way to keep one's health and fitness and to maintain strong immune system. The benefits of working out on both cardiovascular and non-cardiovascular mortality have been well documented (La Gerche and Claessen 2015). Several studies show that individuals who are physically active are stronger against viral and bacterial infections than those who are not physically active. This indicates that working out or doing exercises improves the overall immune function in human (Colbert et al. 2004; Stewart 2004). Physical exercises have been proven to protect individuals against cognitive problems and depression (DiPenta, Green-Johnson, and Murphy 2004; Kohut and Senchina 2004).

Therefore, routine exercise is very important during COVID-19 pandemic. Physical activities and exercises are crucial factors that determine the quality of life (Venkatraman and Fernandes 1997). Not only do these activities maintain fitness and improve immune system to prevent COVID-19 infection, they are also critical in maintaining muscular and bone integrity (Widdowson 1992).

Outdoor exercises are deemed to be beneficial for mental health during pandemic. However, outdoor activities bring the risk of COVID-19 contagion. Hence, those who wish to do outdoor exercises need to be more careful and bear in mind to work out individually, away from the crowd. Outdoor exercises that can be done during COVID-19 pandemic include running, jogging, walking, or cycling. Group exercises such as basketball or soccer are clearly not recommended. Other forms of exercise or physical activities are allowed, as long as they are not done in groups.

To ensure that the body still gets its needs to exercise while keeping safe from COVID-19 contagion, the writer will outline several alternatives of indoor exercises that do not require special equipment. In other words, the exercises discussed here are those that can be done without equipment or using simple equipment at home. These indoor exercises are important because regular exercise has been proven to have protective function against various chronic illnesses, from physiological illness such as cardiovascular diseases to neurological illness such as dementia and depression (Woods, Vieira, and Keylock 2009).

Benefits of Doing Exercises on General Health

On healthy individuals, doing exercises will improve physiological structure renovation and cardiac functions. The right ventricle contains contractile reserve to accommodate for the increase in arterial pressure on normal lungs during exercise. However, intensive and lengthy exercise may cause cardiac fatigue (La Gerche and Claessen 2015).

Physical activities have been proven to cause relatively big physiological changes on immune system. However, the overall effect on immune system and the consequences on infection risk are still up for debate (Romeo et al. 2010). In general, even though intensive exercises such as endurance exercise can cause a decrease in activities and levels of several immune cells, other immune systems can be stimulated by physical activities in moderate intensity (Brolinson and Elliott 2007; Klentrou et al. 2002; Matthews et al. 2002; Nieman and others 1998). Several studies show that athletes and sportsmen face the risk of infection increase during intensive training (called open window of impaired immunity) (Chubak et al. 2006; Moreira et al. 2007). Body's susceptibility to diseases increases on subjects who have less activities and exercises, compared to subjects who routinely exercise in moderate intensity (Woods et al. 1999). The effects of exercises on immune system and susceptibility to diseases are outlined in **Figure 1**.

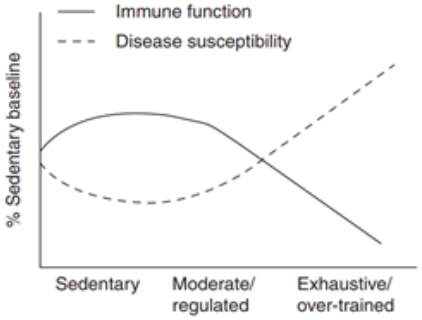

Figure 1. The effects of exercises on the correlation between immune system and susceptibility to diseases (Woods et al. 1999)

Exercise training has been recommended to improve cells mediated by immune functions and to reduce the risks of infection and autoimmune diseases on the elderly (Shimizu et al. 2008). In addition, doing moderate endurance exercises regularly is proven to increase the proliferation of lymphocytes and production of IL-2 and T cell subsets (Nasrullah and Mazzeo 1992; Peijie et al. 2003). Lymphocytes play a crucial role in providing protection against infection. It enhance T and B lymphocytes proliferative response, stimulate effector T cell functions, and enhance macrophage, cytotoxic T cell, and natural killer cell tumoricidal capacities (Bendich 1989).

Benefits of Doing Exercises in Reducing the Risk of Upper Respiratory Illness

Epidemiological studies have consistently shown decrease in the levels of upper-respiratory illness on individuals who are physically active or on those who are fit (Nieman 2011). An epidemiological study conducted for a year and involving 457 adults shows a 23% decrease in upper respiratory illness risks on subjects who engaged in moderate to moderate-intense physical activities regularly, compared to those who did the same irregularly (Matthews et al. 2002).

Participants who performed aerobic activities in moderate to intense frequency showed that, when their fitness were measured, performing those activities for 20 minutes for 5 days a week could significantly reduce upper-respiratory illness of 43%, compared to performing the same activities only once a week (Nieman 2011). Female subjects who frequently walked actively showed pneumonia risk 18% lower than those who did not walk (Neuman, Willett, and Curhan 2010). On the same group, women who performed jogging for more than 2 hours per week showed considerably lower risk of pneumonia than those who did not jog (Neuman, Willett, and Curhan 2010) . This study aims to examine several exercises that can be done at home during the Covid 19 pandemic or when practicing social distancing.

METHOD

This study employs qualitative method with descriptive research design to outline descriptions about alternative exercises to do at home during COVID-19 pandemic.

This study aims to provide information concerning various exercises that can be performed at home during COVID-19 pandemic. Since most countries in the world enforce lockdown in their regions, it is almost impossible to do outdoor exercises. In addition, there are not many options of physical exercises that people can choose from to do at home.

RESULTS AND DISCUSSION

When exercising, it is recommended not to do it excessively. It is also not recommended to do high intensity exercises because it may impair your fitness and health. There are many cases of physical exercises impairing health due to over training (excessive exercise). So far, immunology study in the last two decades described that there are positive changes in immunity during moderate physical exercise (Nieman 2011). Thus, one should really consider the frequency, intensity, duration, and type of exercise before doing physical exercise or workout.

Physical exercise could be performed 3-5 times per week, in moderate intensity, and for a duration of 30-45 minutes. Meanwhile, the type of exercise should be adjusted to the environmental situation. The most important thing is that the exercise to be performed at home or around the house should satisfy what the body needs, including aerobic exercises and anaerobic exercises. Prior to performing exercises, it is recommended to do some warming-ups. Likewise, after the exercises, it is suggested to do some cooling-downs. It is also important to keep hydrated. Drink water 30 minutes before exercising and immediately after exercising should help keeping the body hydrated.

Should you want to do outdoor exercises, however, you need to make sure that you are absolutely fit. It is recommended to keep the safe distance from other people all the time. To exercise outdoor during COVID-19 pandemic, there are several things to be considered. Most important of all is only doing one type of outdoor exercise per day. There is no particular limitation about the length or duration of the exercise. However, it would be better if outdoor exercise time is minimized.

Essentially, human body needs two types of exercise, i.e. aerobic exercise to maintain or enhance cardiovascular capabilities and anaerobic exercise to maintain muscular and bone strengths. These two types of exercise can be performed at home through a series of simple workout. The following simple exercises are easy to do but highly beneficial for improving immune system during COVID-19 pandemic.

Stair Climbing

If there are stairs at your house, stair climbing can be an alternative exercise during COVID-19 exercise. Based on the movements invol-

ved in stair climbing, this exercise can strengthen leg muscles, improv coordination, and enhance cardiovascular system. Stair climbing is an easy exercise in which you climb up and down the stair for 10 minutes followed by 2-3 minutes of resting period. Repeat the exercise three times. The duration of exercise and the number of repetitions can be increased, depending on one's capabilities.

- Variations one can do in stair climbing exercise include, among others:
- Climbing up and down the stair normally.
- Walking sideways up and down the stair, crossing the left and right legs with each step.
- Climbing up and down the stair on tiptoe
- Climbing up and down the stairs with long strides, passing two steps at a time.

Figure 2. Stair Climbing

Jumping Jacks

Jumping jacks are an exercise to strengthen leg muscles, improve coordination, and enhance cardiovascular capabilities. This exercise does not require any equipment. To do jumping jacks exercise **Figure 3**:

- Begin with standing position; straight body with both arms beside the body,
- Stand with legs together or apart as wide as one's shoulders,
- Look straight ahead,
- Open the arms and legs out to the sides. Arms come (clap) above the head and legs wider than shoulders,
- Return the arms and legs into their original position quickly,
- Repeat the series of movements at least twenty times, making a set
- Rest for about two minutes.
- Repeat until 3- 5 sets of jumping jacks exercise.
- The number of series of movements in a set and the number of repetitions of set can be increased, depending on one's capabilities.

Jump Rope

Jump rope is a simple exercise to do at home. This exercise is performed using a 3- to 4-meter rope, depending on one's height. This exercise is very easy to do **Figure 3**:

- Hold the ends of the rope on each hand,
- Pass the rope below the feet and over the head in a circular movement,
- Jump as the rope pass below the feet, keep your body straight at all times,
- Do the jump for 30-60 seconds, according one's capabilities, making a set.
- Repeat until 3-5 sets, with 2 minutes break between each set.

High Knee

Like walking or marching on one spot, high knee exercise is performed by lifting the knees up to one's hip alternatingly. As the knees are lifted, the arms should make a 90o angle with the body. The arm should be lifted in opposite to the knee. For instance, if right knee is lifted, then the left arm should be up; if left knee is up, the right arm is lifted. Even though the movements are like walking, one does not move forward in this exercise **Figure 3**.

Knee high exercise is performed by repeating the movements for 15-30 seconds followed by a 2-minute break, making a set. Repeat the sets three or four times. This exercise can strengthen thighs muscles, abs, and cardiovascular in the long term.

Push ups

Push up is the perfect exercise if you want to strengthen your upper body. Doing this exercise regularly every day will strengthen you chest muscles and make you more fit. To do push up **Figure 4**:

- Get down on all fours, placing your hands slightly wider than your shoulders.
- Your arms should be 10-15 cm away from your body, on each side,
- Straighten your arms and legs,
- Keep your body straight,
- Look ahead,
- Lower your body until your chest nearly touches the floor
- Repeat the movements 15-20 times, making a set
- Repeat for 4-5 sets in each exercise.

Chair Dips

The aim of chair dip exercise is to strengthen arms, shoulders, and chest muscles. This exercise can be an alternative to do at home because it only needs a chair as equipment. To do chair dip exercise, put the chairs behind you and put both hands on the chair. Make sure that your arms are straight. Stretch your legs forward and stand on the balls of your feet. Bring down your

Figure 3. (a) Jumping jack, (b) Jump rope,and (c) High Knee

buttocks until your arms make 90-degree angles with the body without changing the position of your legs. Push yourself up until your arms straighten again. Repeat the movement 10-15 times for a set. A session of chair dip exercise involves 3-5 sets with a 2-minute break between each set **Figure 4**.

Sit Ups

Sit up is a good exercise to strengthen and tighten abdominal muscles. This is a simple exercise that can be performed in any condition, providing there is enough room to lay down. The way to do this exercise is by switching from laying on your back to sitting position just by moving the upper body. To facilitate the movement, the legs should be bent in a 90-degree angle, knees up. Put the arms in a comfortable position, usually beside the ears, crossed over the chest, or holding the back of the neck, during the sit ups. For a set of sit up exercise, do the movement from laying on your back to sitting up 15-20 times. Repeat the set for 3-5 times in each exercise with a 2-minute break between each set **Figure 4**.

Leg Raises

Leg raise exercise aims to strengthen and shape abdominal muscles, especially lower abs. In addition to sit ups, you can do this exercise as a variation to train your abdominal muscles. To do this exercise, begin with laying on your back. Make sure that your back and hips are on the floor. Put your legs together and put your arms beside your body. Lift your legs as one until they make an 'L' shape with the body. Lower your legs until they return to the original position. Make sure that your legs are kept straight all the time. Repeat this movement 10-15 times for a set. A session of leg raise exercise consists of 3-5 sets with a 2-minute break between each set **Figure 4**.

Lunges

In essence, lunge or lunge jump exercise involves a long stride while bending the knee of the striding leg to support the weight of the body. The other leg is also bent to maintain balance. Keep this position for several seconds before strengthening both legs into standing position and repeating the movement with alternating legs (the striding leg is now put behind the body and the other leg is now striding). Look straight ahead and position the arms beside the body or across the chest.

Like step up, lunge exercise is a unilateral exercise, which exercising one part of the body independently. Unilateral exercise is very good to improve balance and coordination. Bilateral exercises such as squat do strengthen muscles on legs and hips, but do not provide the benefits of improved balance and stability that lunge exercise give. Do lunge exercise 10-15 times for each side. To get the most of this exercise, do 3-5 sets every time **Figure 5**.

Figure 4. (a) Sit ups, and (b) Leg raises

Figure 5. (a) Lunges, (b) Step ups, and (c) Squats

Step ups

Step up is an alternative exercise to strengthen thighs muscles. You can use household equipment to help in this exercise. One of the best equipment is chairs. Find a chair that suit your height. Do not use a tall chair because it will make the exercise more difficult and increase the risk of injury. Do not use a chair that is too short because the exercise will not be effective. It is recommended to use a chair without armrests because they may hinder you during the exercise. To do step up, stand on the floor with one foot on the chair. Then, lift your body to stand on the chair. Once both feet are on the chair, stand straight for two seconds before stepping down again. Do the exercise by alternating the starting foot several times. Each set of step-up exercise consists of 10-15 repetitions for one foot. The number of repetitions in the set can be adjusted to suit your capabilities **Figure 5**.

Squats

Squat is a good exercise to train lower body and core muscles. Doing this exercise regularly will strengthen your thighs and buttock muscles as well as improve digestive circulation. However, carelessly performing this exercise will cause in pain in knees, lower back, and upper back. This usually happen because the exercise is performed in a rush, disregarding the body's center of gravity. This exercise is easy to do but requires great attention to balance and center of gravity. From standing straight, push the buttock backwards followed by lowering the body. During the exercise, the body should be kept straight and the eyes should always look ahead. Repeat the movement 15-20 times for a set and each exercise should consist of 3-5 sets with a 2-minute break between each set **Figure 5**.

Mountain Climbers

There are many benefits to gain from mountain climber exercise, provided that you do it regularly. Among the benefits are: (1) improving mobility, because this exercise require speed and coordination between the legs and the arms; (2) increasing joints flexibility, particularly on knees and hips. In addition, this exercise can also reduce the risk of joints injury; (3) affecting heart muscles to increase the blood and oxygen supply; and (4) enhancing lungs' health.

To do this exercise, begin with a push up position, both arms and legs apart. Pull the right leg towards the chest and return it to its starting position. Then, do the same with the other leg. Do the movement repeatedly in quick succession 16-20 times for a set. One mountain climber exercise consists of 2-5 sets with a 2-minute break between each set. You can increase the number of repetitions in each set and in a session according to your capabilities **Figure 6**.

Plank

Plank is essentially not a movement but a static position. This exercise consists of maintaining the plank position for certain duration. To do plank exercise, one has to put both arms, including the elbows, on the floor. The other parts of the body are positioned as if in push up exercise. The aim of this exercise is to maintain this position. Both men and women can do this exercise, in the same posture. In a glance, plank exercise seems easy to do. However, you will feel pressure on the stomach when doing this exercise. This indicates that the muscles are reacting to the posture. Most trainers regarded plank as a simple, yet functional and practical, posture. There are many benefits of doing plank exercise, not only to strengthen the abdominal muscles but also to strengthen other muscles all over the body.

A trained individual can perform plank exercise easily and maintain the position for quite some time. However, an amateur or untrained individual will find it difficult to maintain the stationery position of the whole body. As has been mentioned, to do plank exercise, you have to put yourself in a push up position but with elbows bent in a 90-degree angle so that the arms create 'L' shapes relative to the body. Maintain this position for 20-60 seconds, according to capabilities. Repeat the exercise 3-5 times each time **Figure 6**.

CONCLUSION

There are many options of exercise that one can do at home. This paper outlines 13 exercises to do at home including: stair climbing, jumping jacks, jump rope, high knee, push ups, sit ups, step up, plank, lunges, squats, mountain

Figure 6. (a) Mountain Climbers, and (b) Plank

climbers, chair dips, and leg raises. These exercises can cover your needs to stay healthy and fit during social distancing in COVID-19 pandemic. These exercises consist of cardiovascular exercises (heart, blood vessel, and lungs), muscular and bone strengthening exercises, and joints strengthening exercises. Routine exercises in moderate intensity will keep you fit and healthy to enhance immune system to prevent COVID-19 infection.

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