THE IMPACT OF COVID-19 LOCKDOWN ON PHYSICAL ACTIVITY AND WELL-BEING AMONG ACTIVE ADULTS IN NIGERIA

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Abstract
Measures aiming at containing the Corona-virus disease (Covid-19), include isolation, social distancing, and quarantine. Quarantine and other lockdown instruments were aimed at reducing the number of Covid-19 infections and deaths. It is reasonable to assume that lockdown leads to reduced levels of physical activity in the general population. Potential detrimental health effects of lockdown, such as psychological distress and physical inactivity induced maladaptation must be addressed. The aim of this paper was to review harmful effects of limited physical activity on mental and physical health due to social distancing and quarantine. Harmful effects of limited physical activity on mental and physical health due to social distancing and quarantine and to highlight the effects of simple physical activity regimes, with a special emphasis on acute effects. The paper provide recommendations for evidence based physical activities that are feasible even in lockdown situations, and that hold position to help patients cope with the situation and which build the base for physical activity counseling in Covid-19 lockdown times.
Keywords: Covid-19, well-being, lockdown and SARS-Cov-2

Introduction

The Covid-19 also known as Severe Acute Respiratory Syndrome Corona-virus 2 (SARS-CoV-2) outbreaks hold public health concerns. The stay at home increases sedentary behavior, with unintended adverse outcomes since organized recreation and sports facilities were closed. The corona-virus disease 2019 (Covid-19) has an impact on Physical Activity behaviors worldwide (Antunes, and Frontini, 2021). People around the world stayed at home self-isolated due to the lockdown policy. Although the lockdown is essential and is the best recommendation for preventing the spread of the disease, it may create a new challenge (Yomoda, and Kurita, 2021). Staying at home for a prolonged period can lead to disturbing consequences such as weight gain, social isolation may also cause a reduction in Physical Activity levels (Cypryańska, Nezlek, 2020). The decrease in Physical Activity level may be especially apparent among active individuals habitually practicing sports (Klaperski, and Fuchs, 2021). Diminished Physical Activity resulting from home isolation may worsen a wide range of health conditions, including the chronic ones, such as cardiac and metabolic diseases as well as infectious diseases, due to negative immune-modulation even without substantial weight gain (Antunes, and Frontini, 2021). Therefore, maintaining an active lifestyle at home including mainly Physical Activity is extremely important for the general populations' health, especially for people with additional risk factors including old adults during the quarantine. According to the recommendation of the World Health Organization (WHO), the American College of Sports Medicine (ACSM) Position Stand, and Physical Activity guidelines for healthy adults, adults should do at least 150 minutes of moderate aerobic exercise or do at least 75 min of vigorous aerobic exercise during the week. Engaging in regular exercise is one of the best things for overall health, well-being, and longevity (Cypryańska, Nezlek, 2020). Exercise helps to keep cardiovascular system healthy, to

improve your cognitive function, your mood, and your sleep, and to help you remain healthy into your old age (Antunes, and Frontini, 2021).
It's no secret that, during the Covid-19 pandemic, healthy routines and habits suffered. The covid is an acute respiratory illness in humans caused by a corona-virus, capable of producing severe symptoms and in some cases death, especially in older people and those with underlying health conditions (Wu, Zhao, 2020). It was originally identified in China in 2019 and became pandemic in 2020.The corona-virus disease 2019 (Covid-19) is a communicable respiratory disease caused by a new strain of corona-virus that causes illness which may include headache, loss of smell and taste, nasal congestion and runny nose, cough, muscle pain, sore throat, fever, diarrhea, and breathing difficulties, shortness of breath, and fever. Which resulted to the closure of gyms, limited group fitness and decreases in day to day movement, maintaining activity levels has been a challenge for many (Almeida, Gomes da Silva, and de Dias Marques, 2020).

This lack of exercise not only impacts our physical bodies, but it can also greatly impact our mental well-being. With restrictions easing, it is now more important than ever to get moving, says exercise and public health expert Dr. Patricia Doyle-Baker that, exercise and mental wellness are key to our way out of the effect of the pandemic as restrictions eases Wu, Zhao, and Yu, 2020). Emotions elicited during the Covid-19 pandemic, like fear, have resulted in less healthy habits in people which was seen take effect through increases in alcohol intake, substance use and being less active (Ammar, Trabelsi, Brach, Chtourou, Boukhris, and Masmoudi, 2021). While quarantine and social distancing measures seem indispensable as of now, possible detrimental social, psychological, health and economic consequences must also be considered (Antunes, and Frontini, 2021). Psychological impact of quarantine can be wide-ranging, substantial and potentially sustained. Symptoms include emotional disturbance, depression, stress, low mood, irritability, insomnia, post-traumatic stress symptoms and anxiety. Little is known about the psychological effects of less rigorous intensity, but prolonged benefits (Bird, Karageorghis, and Hamer, 2021).

Moderate intensity exercise may decrease the risk of acquiring an Upper Respiratory Tract Infection (URTI). Research has shown that exercise in moderately fit and active people with a URTI does not prolong or intensify the illness. Regular moderate physical activity has wide reaching health benefits for people of all ages, sexes, races, health conditions and shapes. It manages weight; reduce morbidity and mortality rates, increased quality of life and independence in old age (Brooks, Webster, Smith, Woodland, Wessely, and Greenberg, 2020). Physical exercise can also help reduce the risk of acute life threatening events. To maintain these effects sustained, optimally lifelong physical activity is required, since acute benefits are transient and dissipate over time. However, knowledge about acute impact of single exercise bouts might facilitate the motivation and communication with patients to take up more activity (Cheval, et al., 2021).

The current crisis could potentially be a window of opportunity, a learning moment to initiate long-term activity. 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, and 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 likely be seen in many areas such as health and social care and the mental well-being of people all across the globe(Jin, Lin, McLeay, 2020).

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.

The concept of Physical Activity

Physical activity in daily life can be categorized into occupational, sports, conditioning, household, or other activities (Haseler, Crooke, Haseler, 2019). Exercise is a subset of physical activity that is planned, structured, and repetitive and has as a final or an intermediate objective the improvement or maintenance of physical fitness. According to international guidelines, exercise training, widely regarded as the cornerstone of pulmonary rehabilitation, is the best available means of improving muscle function and exercise tolerance in patients with Chronic Obstructive Pulmonary Disease (COPD)(Li, and Liu, 2020). To contextualize the status quo regarding definitions of physical activity, I trace the origin and growth of the most widely accepted definition, published by (Caspersen, (1985) in(Haseler, Crooke, Haseler, 2019). They define physical activity as "any bodily movement produced by skeletal muscles that results in energy expenditure". This definition produces a very specific way of understanding physical activity. The focus on "skeletal muscles" and "energy expenditure" frames physical activity as a specific mechanistic act (Haseler, Crooke, Haseler, 2019).

Covid- 19 and Regular Physical Exercise

Physical activities, personal contact with colleagues, friends and family have been limited due to public health measures to curb the spread of Covid-19, such as quarantine, lockdown, self-isolation, and maintaining social distance (Vancini, 2021). People experienced a general decline in well-being, deterioration in mental health, and an increase in psychological distress such as stress, anxiety, depression, and feelings of isolation. This negative impact may in turn affect compliance with public health measures (Puyat 2020). Hence, there is a need to explore and identify alternative and complementary activities that promote mental health and well-being during Covid-19 and lockdowns. It is well-established that physical activity or exercise is essential to improve and or maintain physical and mental health and improve the quality of life (Vancini, 2021).

Various physiological and psychological mechanisms have been proposed to explain the positive effects of physical activity (Stubbs, 2017). Physiologically exercise may increase the levels of hormones, endorphins and Brain-derived Neurotrophic Factor (BDNF), which could make people feel happy and less stressed (Julia and Wendy 2017). Moreover, psychologically, exercise gives people the opportunity to have "time out" from the stressor, and regular exercise improves self-efficacy to overcome the difficulties they face. The Covid-19 pandemic has heightened people's attention to the positive effects of exercise on physical health. During the pandemic, the news media disseminates a great deal about the therapeutic effects of physical activities on physical health and people with mild corona virus infection (Vancini, 2021).

Regular and long-term physical exercise enhances the body's immune surveillance capabilities, acts as an anti-inflammatory agent, reduces the risk of developing numerous chronic diseases, and improves the general level of physical health and disease prevention and resistance (Li, and Liu, 2020).Initial evidence has shown that individuals can maintain and promote mental health through exercise during the pandemic (Gupta et al., 2021). However, measures restricting the spread of COVID-19 have led to a decline in physical activity for most children and adolescents, especially among boys and older children and adolescents (Yomoda and Kurita, 2021).

Physical Inactivity during Lockdown

There is extensive evidence on the positive impacts of physical activity for both physical and mental health (Jin, Lin, McLeay, 2020). For example, regular physical activity is associated with reduced rates of all-cause mortality, obesity, cancer, cardiovascular disease, stroke, and diabetes, among other physical conditions, as well as depression, anxiety, and other mental health problems. (Li, and Liu, 2020). Regular physical activity also leads to improvements in cardio-respiratory and muscular fitness, functional health, cognitive function, wellbeing, and quality of life. However, levels of physical inactivity are rising in many countries (Jin et al, 2020). Physical inactivity is the fourth leading risk factor for global mortality, causing premature mortality worldwide. Physical inactivity is also one of the most important risk factors for chronic diseases globally. Even short-term physical inactivity, over a period of 1–4 weeks, has been associated with negative changes in cardiovascular function and increased cardiovascular risk factors (Vancini, 2021).

Since December 2019, there has been an outbreak of corona-virus disease (Covid-19). Lockdowns and stay-at-home orders have been announced globally to control the spread of the disease, disrupting people's usual behaviors (Faulkner, Rhodes, Vanderloo, Chulak-Bozer, O'Reilly, Ferguson, 2020). In many countries, this has involved the closure of non-essential businesses, including gyms, outdoor sports amenities, and playgrounds, as well as limits placed on how often people could leave their homes each day.

However, how this has affected physical activity levels has been complex (Lou, Yan, 2020). Large cross-sectional surveys in many western countries have suggested decreases in overall physical activity when comparing self-reports of activity levels before to during lockdowns. The majority of longitudinal studies to date also show an initial drop in physical activity levels at the start of lockdown restrictions as do data from wearable fitness trackers in a number of countries (Faulkner, Rhodes, Vanderloo, Chulak-Bozer, O'Reilly, Ferguson, 2020).

Getting back into exercise routines after lockdown

Doyle (2020), suggested that, those who have become more sedentary re-enter or introduce exercise into their routines."The best way to start is to put more activity into your typical day," she says. "If you can, take the stairs on campus or at home, where you might normally take an elevator. Walk outside instead of inside when moving from classes or meetings or around the block at the start or end of a workday breathing in fresh air is an added bonus for our health. She further suggests that, after more activity has been introduced, start looking into adding more strenuous exercise such as cardio, followed by increasing the duration of workouts, incorporating some resistance training, and maybe considering a local or on-campus group fitness class. Doyle (2020), says there are benefits to working out with other people: "Remember that happy feeling related to exercise, the dopamine response. This neurotransmitter might further increase our need to connect with others, so finding a friend or co-worker to stay active (with) might not only help us stay active, but further improve our well-being and sense of connection."

Physical activity principles and guidelines

The new WHO 2020 Guidelines stress that any amount of physical activity is better than none, even when the recommended thresholds are not met this is a very positive message for much of the population who currently fall well short of the desirable minimum (Faulkner, Rhodes, Vanderloo, Chulak-Bozer, O'Reilly, Ferguson, 2020). These are:

i. **Frequency:** This is how often the individual should go with the exercise programme. For example, exercising on most if not all days of the week or 3-4 days per-week for at least 12 weeks among adults with high blood pressure.
ii. **Intensity:** How hard the exercise is taken, the degree of effort or exertion put forth by a subject workout. Adult with hypertension should engage in moderate intensity aerobic exercise and moderate intensity dynamic resistance exercise one or more repetitions.
iii. **Type:** Mode or kind of exercise, the individual should engage in aerobic and dynamic resistance training. For example, jogging, waking, dancing, climbing stairs and active sports such as basketball or tennis, push-up/ pull-up, weight lifting etc.
iv. **Time:** This is the duration and how long the exercise should go, for example, 30-60 minutes per-day or all days of the week or 150 minutes or more minute's per-week.
v. **Progression:** Advancement of the exercise session; progression should be gradual and avoid large increase in any of the principles of exercise and consider level of BP control; this is done to avoid damages.

The importance of physical activity during and post covid-19 lockdown

Regular exercise has several beneficial effects on your body that can improve the function of your musculoskeletal system, your cardiovascular system, your respiratory system, your metabolism, and even your brain (Vancini, 2021). Engaging in regular exercise significantly reduces your odds of developing heart disease, diabetes, kidney disease, lung disease (Faulkner, Rhodes, Vanderloo, Chulak-Bozer, O'Reilly, Ferguson, 2020).

Musculoskeletal Benefits

Some of the most obvious benefits of exercise relate to your musculoskeletal system: you get stronger muscles and bones (Haseler, Crooke, Haseler, 2019). As one age, you will have less chance of developing serious joint problems and fractures, and your balance (and chances of falling) will be reduced. With decreased physical activity there is the likelihood of musculoskeletal reconditioning. During periods of lockdown where many people's daily activity movements are restricted, musculoskeletal reconditioning is likely to happen in most people (Andersen, Rambaut, Lipkin, Holmes, Garry, 2020). In fit and healthy people this will be less noticeable, but in older people, people with diagnosed health conditions or people who were already functioning very close to the functional threshold, musculoskeletal reconditioning will be more pronounced (Li, W.; and Liu, 2020). This musculoskeletal reconditioning may have a significant impact on these vulnerable populations and may potentially increase the risk of injuries related to falls, such as hip fractures. This will in turn have implications for health and social care services already under stress (Lou, Yan, 2020).

Some specific musculoskeletal benefits of exercise include:

i. Exercise increases the size and strength of your muscle fibers.
ii. Exercise increases the strength of your ligaments and tendons.
iii. Exercise increases the number and density of the capillaries that supply blood to your skeletal muscles.
iv. Exercise increases the number and the size of the mitochondria (the power plants) in your muscle tissue, which allows your muscle to burn more energy (Zbinden-Foncea, Francaux, Deldicque, and Hawley, 2020).

Cardiovascular Benefits

According to (Klaperski and Fuchs, 2021). People who exercise regularly have a much lower chance of developing serious heart disease and vascular disease. These are:

i. Exercise improves your overall cardiac function so that you can pump more blood with each heartbeat.
ii. Exercise reduces your blood pressure, especially if you have essential hypertension.
iii. Exercise improves your overall vascular function.
iv. Exercise helps to prevent atherosclerosis, the disease that causes heart attacks, and many kinds of stroke.

Respiratory Benefits

Regular exercise helps to prevent chronic lung disease:

i. Exercise improves your lung capacity.
ii. Exercise increases the blood flow to your lungs, allowing the lungs to deliver more oxygen into the blood (Lou, Yan, 2020).

Metabolic Benefits

Physical activity exerts a major influence on human metabolism. Physical activity acutely increases glucose uptake, thus lowering circulating blood glucose level (Zhong, Huang, Wang, Che, Song, 2020). This uptake by contracting skeletal muscles takes place through insulin independent mechanisms. A single exercise bout also induces beneficial metabolic effects after exercise (Lum, and Simpson, 2021). Even relatively low volume of simple physical activity, such as walking or cycling has been shown to induce favorable effects on various metabolic markers in healthy and diseased population (Klaperski, and Fuchs, 2021). As little as 15 min of post-meal walking may blunt the glycemic response in healthy women and in women at risk of diabetes. (Lou, Yan, 2020), found that 6 min of another easily available physical activity, stair climbing and descending sufficed to reduce post-prandial glucose levels in inactive middle aged men with impaired glucose tolerance. A single bout of physical activity is followed by an acute decrease in blood pressure, known as post-exercise hypotension (Lum, and Simpson, 2021). A current systematic review based on 65 individual studies found that physical activity, regardless of participant and exercise characteristics, leads to a clinically relevant reduction in blood pressure (Li, and Yuan, 2020).

Muscle insulin sensitivity is increased for up to 48 h after exercise in healthy individuals. Regular exercise greatly improves your overall metabolic function, which helps to maintain your general health and to:

i. Increases muscles ability to burn fat more efficiently.
ii. Increases the mobilization of fatty acids into the bloodstream, from your fat deposits. (These last two effects of regular exercise "tune" your metabolism into more of a fat-burning machine.)
iii. Exercise reduces your triglyceride blood levels.
iv. Exercise increases your HDL cholesterol (good cholesterol).
v. Exercise reduces insulin resistance. Regular exercise helps to prevent type 2 diabetes in people who are at increased risk for this disease (Zhong, Huang, Wang, Che, Song, 2020).

Exercise and the immune system

The immune system is very responsive to exercise, depending on both the duration and the intensity of effort. Exercise causes multiple micro-injuries to the muscles, triggering a local and systemic inflammation reaction (Lum, and Simpson, 2021). During a moderate to high intensity exercise session lasting less than 60 minutes, the number of leukocytes (white blood cells) and several cytokines (proteins produced by the immune system to stimulate the proliferation of defense cells) increases rapidly in the bloodstream. The increase in the

number of neutrophils (a type of white blood cell) often lasts for up to 6 hours after the end of the exercise session (Vancini, 2021). This physiological response to stress caused by exercise is followed, during the recovery period, by a drop in the number of leukocytes in the bloodstream to a level below that measured at the start of the exercise session (Yarimkaya, and Esentürk, 2020).

Other Benefits

i. Exercise improves your immune function, which reduces your chance of infections.
ii. Exercise appears to reduce your chances of getting breast cancer, pancreatic cancer, and certain other gastrointestinal cancers.
iii. Exercise helps to prevent gallstones.
iv. Exercise helps to prevent the physical and cognitive decline of aging.
v. Exercise reduces your risk of Alzheimer's disease.
vi. Exercise helps with smoking cessation.
vii. Exercise plays an important role in preventing and treating obesity.
viii. Exercise improves cognitive function in people of all ages.
ix. In older people, regular exercise is associated with a reduced risk of falls.
x. In pregnant women, exercise lowers the risk of gestational diabetes and postpartum depression (Haseler, Crooke, Haseler, 2019).

Given all the physiologic benefits it produces, it is easy to see how regular exercise can help to prevent cardiovascular disease. In addition to the direct beneficial effects of exercise on the heart, regular exercise also improves several important cardiac risk factors (Zhong, 2020). Exercise lowers blood pressure, helps prevent obesity, reduces triglyceride levels, increases HDL cholesterol levels, and improves insulin resistance and thus helps to prevent or even reverse metabolic syndrome. (Li, and Yuan, 2020).An exercise routine has even been shown to be helpful in achieving smoking cessation.

Regular exercise is one of the most beneficial habits you can develop for your overall health, well-being, and longevity. Regular moderate physical activity has wide reaching health benefits for people of all ages, sexes, races, health conditions and shapes, as shown in reduced morbidity and mortality rates, increased quality of life and independence in old age (Haseler, Crooke, Haseler, 2019). Physical fitness can also help reduce the risk of acute life threatening events. To maintain these effects sustained, optimally lifelong physical activity is required, since acute benefits are transient and dissipate over time, unless physical activity stimulus is repeated (Li, and Yuan, 2020). However, knowledge about acute impact of single exercise bouts might facilitate the motivation and communication with patients to take up more activity now. The current crisis could potentially be a window of opportunity, a learning moment to initiate long-term activity (Li, and Yuan, 2020).

Conclusion

Lockdown implemented in an attempt to contain the SARS-CoV-2 virus is unprecedented for most countries, and represents a major societal challenge with conceivable repercussions for people’s mental and physical health. Physical activity has the potential to ward off detrimental cardio-metabolic effects of inactivity and to strengthen psychological resources and coping skills. Physicians and other health care professionals should use this time as a window of opportunity to provide physical activity counseling to their patients.

Recommendations

Considering the possible impact of physical inactivity during and after the lockdown, the following are some of the recommendations stated. These are:

i. Physiotherapist should encourage people to break their periods of inactivity
ii. Encourage people to engage in aerobic activity on a daily basis, because, very short periods of exercise have been reported to have real health benefits
iii. Physiotherapists need to focus on effective messaging during lockdown. This may include positive messages about the benefits of physical activity aligned with the concerns that people have during lockdown and pandemic.

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