Exercise Consideration for People with Obesity Amidst Covid-19 Pandemic: a Scoping Review

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Abstract

Introduction: The current coronavirus disease 2019 (COVID-19) pandemic has been limiting people's activities outside the home in order to reduce the spread of the virus. This limitation causes a decrease in people's physical activity patterns. Physical activity is important for people with obesity to avoid further increase in body weight or even to help to reduce body weight. The aim of the review reports physical activities that can be done by people affected by obesity in the covid-19 pandemic. The method: The scoping review method is used to map the type of physical activities for obese people. Two databases namely PubMed and EBSCO-host have been used for literature searching. The result: Ten articles were selected, namely research that included obese people of various ages such as children, adults, and the elderly. There were eight physical activities recommendations that obese people can do. There was a moderate physical activity which includes both aerobic and anaerobic training, low-intensity exercise and breathing exercise, leisure-time physical activities, home training such as pilates, yoga, and dancing, and then gym at home with simple equipment for bodyweight, isometric, resistance band, and hand-held weight exercise. Duration for exercise is recommended for 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity physical activity per week. Conclusion: Many types of physical activity can be done by obese people in the covid-19 related lockdown and restriction to keep the body maintain health, to reduce body weight, and prevent exacerbations of obesity.

Keywords: *Covid-19, Obesity, Physical Activity,*

Introduction

By 2030, the agenda of the International Sustainable Development Goals (SDGs) is targeting a one-third reduction of premature deaths caused by non-communicable diseases, through prevention and treatment and promoting mental health and well-being (WHO, 2021b). A non-communicable disease (NCD) is a medical condition or disease that is by definition non-infectious and non-transmissible among people (WHO, 2021b). According to WHO, non-communicable diseases (NCDs) kill 41 million people each year, equivalent to 71% of all deaths globally (WHO, 2021a). The four main types of NCDs are cardiovascular diseases, cancers, chronic lung diseases, and diabetes (Collaborators, 2017; WHO, 2021b). There are

two main risk factors for NCDs, modifiable behavior risk and metabolic risk (WHO, 2021b). Modifiable behaviors, such as tobacco use, physical inactivity, an unhealthy diet, and the harmful use of alcohol, all increase the risk of NCDs. Metabolic risk factors leading to attributable deaths globally are elevated blood pressure followed by raised blood glucose and especially overweight and obesity (Collaborators, 2017; WHO, 2021b, 2021a).

Obesity is defined as abnormal or excessive fat accumulation that may impair health (Engin, 2017). Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults (Blüher, 2020). The principle of managing obesity is excessive energy intake by an active lifestyle (Gadde et al., 2021). The energy intake has to be balanced with the energy requirement. People with obesity need the right pattern of physical activity to avoid worsening conditions (Gadde et al., 2021). Considerable evidence demonstrates that a healthy diet and regular physical activity can help improve health and reduce the risk of certain chronic diseases such as obesity (Dietz & Santos-burgoa, 2020). The recommendation for physical activity for obese people includes low to moderate intensity movements which are conducted continuously. Regular exercise will increase energy expenditure and muscle mass (Orringer, 2020).

Currently, the world is being hit by the COVID-19 pandemic, which is a disease caused by a Severe Acute Respiratory Syndrome Coronavirus 2 (SARS COV-2) (Zhou et al., 2019). One of the measures to prevent transmission is by limiting activities outside the home (Dietz & Santos-burgoa, 2020). However, the limitation of people's outdoor activities impacts the decrease in physical activity of every level of society, including people with obesity (Clemmensen et al., 2020). Low activity for obese people will be dangerous and increase the risk of a worsening condition that can lead to death (Clemmensen et al., 2020).

WHO recommends 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity physical activity per week, or a combination of both (Boulé & Prud, 2020). Also According to the Department of Health and Human Services and Department of Agriculture US, Adults need at least 150 minutes of moderate-intensity physical activity and should perform muscle-strengthening exercises on 2 or more days each week. Youth ages 6 to 17 years need at least 60 minutes of physical activity per day, including aerobic, muscle-strengthening, and bone-strengthening activities (USDA, 2020).

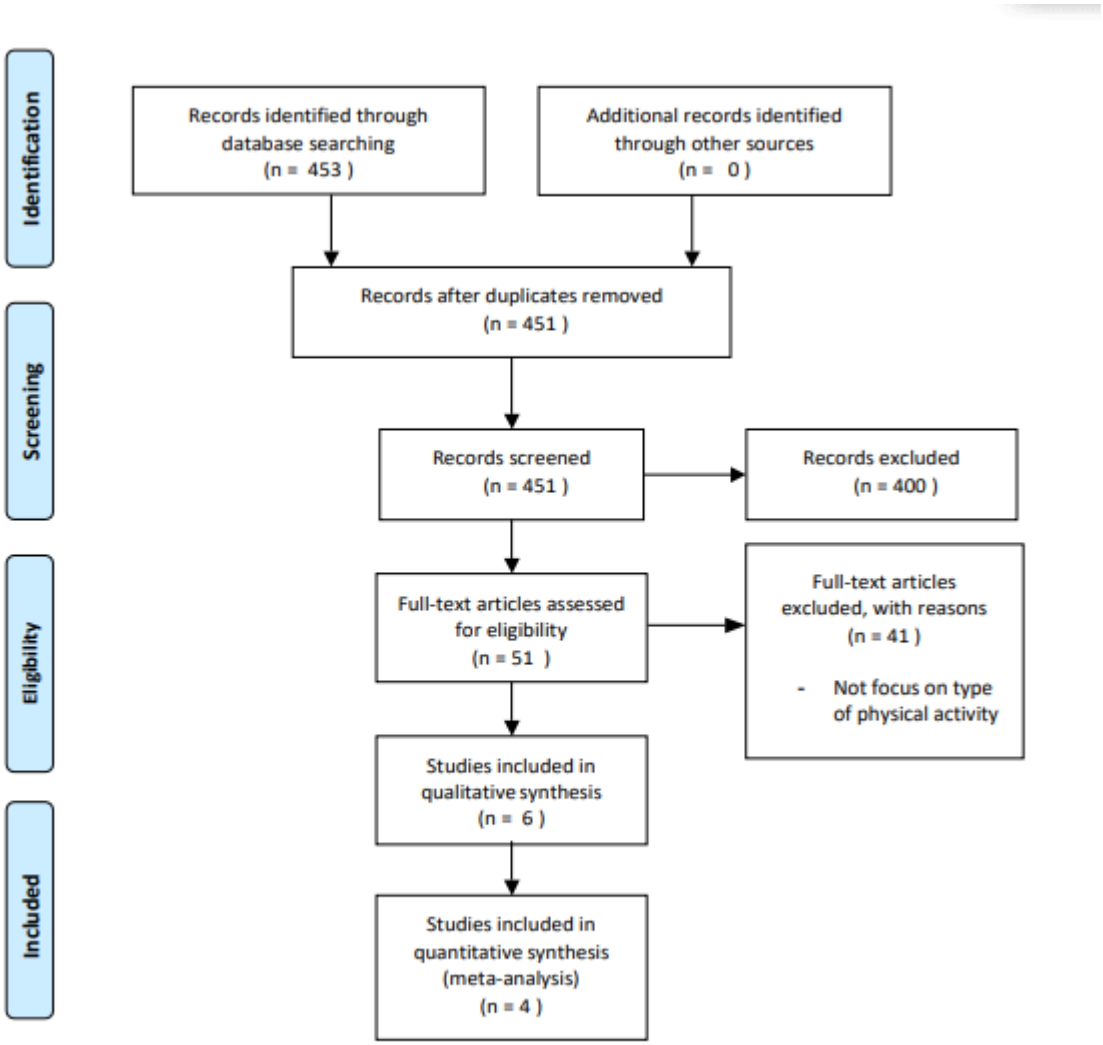
In the midst of lockdown and restriction during the pandemic, many people become physically inactive. Physical inactivity is the term used to refer to an inability to achieve the recommended levels of physical activity for health (Abraham et al., 2012). To avoid premature deaths related to physical inactivity, health care professionals and public health agencies should act together in promoting physical activity during quarantine (Peçanha et al., 2021).Therefore, with the necessary closure of gyms, athletic centers, and parks as part of lockdown (which potentially adds to the decline in physical activity), home-based exercise programs become relevant to mitigate the deleterious effects of increased inactivity (Peçanha et al., 2021)

This scoping literature review presents a review of types of physical activities for obese people amidst Covid-19 Pandemic has been published in the literature. The result of the scoping review provides information about the type of physical activities or exercise for obese people which can be used in educating people in the community about physical activities that can be done amid a pandemic.

Research Methodology

The method used in this literature study was scoping review. The databases searched included PubMed and CINAHL via EBSCO-host. The publications were limited to 2020-2021 relevant to the pandemic covid-19 context. This scoping review considered studies that include people with obesity and types of physical activities or exercises implemented during pandemic Covid-19. The total of searches in databases yielded 453 articles. The keywords used were "Exercise", "Obesity", "Covid-19 Pandemic", then arranged in the form of a combination of keywords: ((((("Exercise"[Mesh])) AND "Obesity"[Mesh]) AND "COVID-19"[Mesh]. The inclusion criteria in this review were all types of quantitative and qualitative studies, peer-reviewed articles, full-text, written in English, and relevant to the topic. And the exclusion criteria were articles that did not focus on types of physical activity. After sorting, 10 articles met the inclusion criteria and will be used in this literature study.

The review of the study selection process was presented in a PRISMA flow diagram (Picture 1).



Results

The total of searches in databases yielded 453 articles. After removing some duplicate articles, 451 articles remained. In the next stage, 400 articles were excluded after screening by title and abstract. The full text of 51 articles was assessed for eligibility. Of these, 41 articles were excluded because they do not meet the inclusion criteria. Therefore, 10 articles met the inclusion criteria and were included in this review. (Table 1)

Study	Sample	Methodology
Morales *et al*, (2021), Spain	All ages with chronic diseases, including people with obesity	Observational analytic study
Wang *et al*, (2020), Hong Kong	The general population, Including Obese people	Cohort researches
Hossein *et al*, (2021), Iran	A 20-year-old woman with a body mass index (BMI) of 29 (overweight)	Case Report
Hudson *et al*, (2020), USA	People with obesity and chronic disease	Grounded theory
Christina *et al*, (2021), USA	Adult and children who had obesity	Content Analysis Perspective
Naran *et al*, (2020), Pennsylvania	50 person patients with obesity	Case Report
Lim et al, (2020), South Korea	Obese people.	Content Analysis Perspective
Kim et al, (2021), South Korea	179 pediatric obesity patients	Retrospective observational study
Minsky et al, (2021), Israel	279 adults treated in hospital-based obesity clinics	Cross-sectional study

A total of 10 studies were included in this review. Most of the studies were quantitative and qualitative. Publication years ranged between 2020 and 2021. Respondents from each study mostly are general people with obesity and low levels of activity and exercise during the pandemic.

Discussion

During the covid-19 pandemic, many countries enforce lockdown and social distancing to prevent the spread of the virus. A report from China showed restrictions and social distancing might reduce the number of COVID-19 infections and deaths (Tian et al., 2020). Social isolation due to the COVID-19 outbreak potentially increases physical inactivity, which may seriously increase the global burden (Peçanha et al., 2021). Physical inactivity can lead to an increased risk of chronic disease (Kass et al., 2021). Also one of the main causes of chronic

diseases is obesity. Obesity is a significant risk factor for and contributor to increased morbidity and mortality, most importantly from cardiovascular disease (CVD) and diabetes, but also from cancer and chronic diseases (Gadde et al., 2021).

Physical inactivity strongly predicted the risk of obesity (Hamer et al., 2020). But physical activity level significantly decreased during the COVID-19 lockdown. Also, research showed that only a reduction in physical activity level significantly predicted weight gain. Weight gain and metabolic syndrome are a global crucial public health issue concerning sedentary behave, during the recent COVID-19 pandemic (Dor-haim et al., 2021). To prevent an increase in chronic disease in the community due to physical inactivity during pandemics. Therefore, many healthcare professionals and health experts perform re-modification of physical activity (Table 2).

Study	Intervention
Morales *et al*, (2021), Spain	- Moderate-Physical Activity (70 % maximum heart rate, 5 times a week) - Cardiorespiratory fitness, muscular strength, flexibility, and body composition - Workout or shorter bouts of exercising
Wang *et al*, (2020), Hong Kong	- Aerobic exercise (Moderate-Intensity Continuous Training) - Anaerobic exercise (Resistance training and High-Intensity Interval Training)
Hossein *et al*, (2021), Iran	- The exercise protocol guideline lasted three days and included nine training sessions in the morning, evening, and night.
Hudson *et al*, (2020),	- Leisure-time physical activity - Traditional aerobic endurance activities - Home-based exercises such as Pilates, yoga, and dancing - Traditional resistance training regimens.
Christina *et al*, (2021), USA	- Join health campaign to promote physical activity - Using free digital exercise tools, using media platforms such as YouTube to follow simple exercises such as dancing or yoga.
Naran *et al*, (2020), Pennsylvania	- Use telemedicine for consultation for the suitable type of activity - Physical activity regimens by healthcare professionals that can be performed at home.
Lim et al, (2020), South Korea	- Walking or jogging in open spaces or using an indoor ergo cycle or treadmill - Home training using YouTube or joining online exercise classes - Exercise with family members or partners (e.g., jump rope in the parking lot, badminton in the backyard, and indoor table tennis)
Kim et al, (2021), South Korea	- Home-based training with simple equipment for bodyweight, isometric, resistance band, and hand-held weight exercise
Minsky et al, (2021), Israel	- Using telemedicine for obesity care management.
Füzéki et al, (2020), London	- Possible outdoor activities include (brisk) walking, jogging, and cycling. - Staircases can be used for exercising the lower extremities. - Walking in place or around the apartment, jumping and hopping are such options.

- Muscle-strengthening exercises such as sit up, push up, squats, etc.,

Maintaining proper physical conditioning can improve immune function and potentially protect obese people from serious complications related to respiratory infections (Economos et al., 2021; Hudson & Sprow, 2020. By modifying physical activity, many people can remain active even though they are at home. The role of physical activity in mitigating COVID-19 severity is underscored as a public health strategy (Economos et al., 2021; Hudson & Sprow, 2020. Many types of physical activity can be done by obese people in the covid-19 related lockdown and restriction to keep the body maintain health, to reduce body weight, and prevent exacerbations of obesity (Table 3).

Study	Findings
Morales *et al,* (2021), Spain	V-PA is only recommended for trained individuals. For vulnerable groups such as obesity, M-PA is recommended
Wang *et al,* (2020), Hong Kong	Aerobic Training is more effective in reduced visceral and liver fat and total abdominal fat compared to Resistance Training
Hossein *et al*, (2021), Iran	Low-intensity, short-term exercises were able to prevent an obese person from losing muscle strength
Hudson *et al,* (2020),	Maintaining proper physical conditioning can improve immune function and potentially protect obese people from serious complications related to respiratory infections
Christina *et al,* (2021), USA	The role of physical activity in mitigating COVID-19 severity underscores as a public health strategy
Naran *et al,* (2020), Pennsylvania	66% of participants reported a score >4, indicating their abilities to achieve their weight loss goals
Lim et al, (2020), South Korea	Increasing physical activity is a challenge, it may require some creativity, even for the most motivated and health-conscious person.
Kim et al, (2021), South Korea	Reduced physical activity during the COVID‑19 pandemic exacerbates obesity and negatively impacts HbA1C elevation
Minsky et al, (2021), Israel	Respondents who received virtual obesity care were more than twice increased weekly exercise time during lockdown (OR, 2.4; 95% CI 1.12–5.00; p = 0.022).
Füzéki et al, (2020), London	Excessive exercise (high volume high-intensity training) is not recommended since it can lead to transient states of immunosuppression and an increase of susceptibility to infection

In the stages of physical activity, obese people must be aware of the urgency of maintaining physical activity to prevent exacerbations. Increasing awareness of maintaining physical activity can be done through the responsiveness to health campaigns (Economos et al., 2021). Engaging with a family member or partner in physical activity can maintain motivation and

stability (Lim et al., 2020; Minsky et al., 2021). After feeling quite excited, it is important to choose physical activity guidance, whether guided actively or passively. Telemedicine can be used to conduct and choose physical activity guidance (Minsky et al., 2021).

If possible, exercise class activities during this pandemic are carried out (Lim et al., 2020), but it is necessary to pay attention to protocols and participant limits in class, but online classes can also be a good alternative The use of YouTube platform is recommended to make the technique visually and efficiently done at home (Economos et al., 2021; Lim et al., 2020) and respondents in the research (Minsky et al., 2021) who received virtual obesity care were more than twice increased weekly exercise time during the lockdown. The type of physical activity was described in most studies (Baena Morales et al., 2021; Wang et al., 2020).

Most studies mention Moderate-Physical Activity such as Aerobic exercise (Moderate-Intensity Continuous 7 Training) and Anaerobic exercise (Resistance training and High-Intensity Interval Training) is the best type that obese people can apply with the best duration of physical activity is >250 min/week; >30 min per time and frequency: >5 days/week (Baena Morales et al., 2021; Morales & Riera, 2021). Next, determine the appropriate physical activity according to the needs and abilities, the recommended forms are Leisure-time physical activity, Traditional aerobic endurance activities such as jogging, running, biking, and rowing are still very effective while maintaining appropriate social distancing or has ergometer equipment in the home, pilates, yoga, and dancing through videos or online, walking or jogging using an indoor ergo cycle or treadmill, badminton in the backyard, and indoor table tennis (Kim et al., 2021b; Morales & Riera, 2021).

The intensity of physical activity is based on individual needs and abilities. Low-intensity, short-term exercises were able to prevent obese people from losing muscle strength (Hossein et al., 2021). V-PA is only recommended for trained individuals. For vulnerable groups such as obesity, M-PA is recommended (Morales & Riera, 2021). Aerobic training is more effective in reduced visceral and liver fat and total abdominal fat compared to resistance training (Wang et al., 2020). And in (Füzéki et al., 2020) excessive exercise (high volume high-intensity training) is not recommended since it can lead to transient states of immunosuppression and an increase of susceptibility to infection (Füzéki et al., 2020; Kim et al., 2021a; Naran et al., 2020)

Conclusion

People with obesity require continuous physical activity to keep the body from exacerbations and stay healthy. In the midst of the COVID-19 pandemic, of course, increasing physical activity is a challenge, it may require some creativity, even for the most motivated and health-conscious person.

This review maps some exercise recommendations for people with obesity. It is important to be physically active to maintain health. Some activities which can be done at home and places around the home can be done in the limitation of traditional outdoor activities due to the Covid-19 pandemic.

We recommend before doing any physical activity suggestion here consult your condition to a health professional.

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