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

Azrania Fatima, Syifa Eka, Dhiyaa Ulhaq, Hartiah Haroen
Faculty of Nursing, Universitas Padjadjaran, Bandung, Jawa barat, Indonesia
Email: azrania18001@mail.unpad.ac.id

Abstract

Introduction: The current coronavirus disease 2019 (COVID-19) pandemic has been limiting people's activities outside their home to reduce the spread of the virus. This limitation causes a decrease in people's physical activity pattern. 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 is to reports physical activities that can be done by people with 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 CINAHL, 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 for people with obesity. They are 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 do gym at home with simple equipments 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 people with obesity 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, exercise, obesity, physical activity.

Introduction

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 by 2030 (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). 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, they are modifiable behaviour risk and metabolic risk (WHO, 2021b). Modifiable behaviours, such as tobacco use, physical inactivity, 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). Regular exercise will increase energy expenditure and muscle mass (Orringer, 2020). Considerable evidence demonstrates that a healthy diet and regular physical activity can help to improve health and reduce the risk of certain chronic diseases related to obesity (Dietz & Santos-burgoa, 2020). The recommendation for physical activity for obese people includes low to moderate intensity movements which are conducted continuously.

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 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 because it increases 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 US Department of Health and Human Services and Department of Agriculture, adults need at least 150 minutes of moderate-intensity physical activity and they should perform muscle strengthening exercises at least twice a week and people age 6 to 17 years need at least 60 minutes of physical activity per day, including aerobic, muscle-strengthening, and bone strengthening activities (USDA, 2020).

Lockdown and outdoor activity restriction during the pandemic cause 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 centres 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 people with obesity amidst Covid-19 pandemic that has been published in the literature. The result of the scoping review provides information about

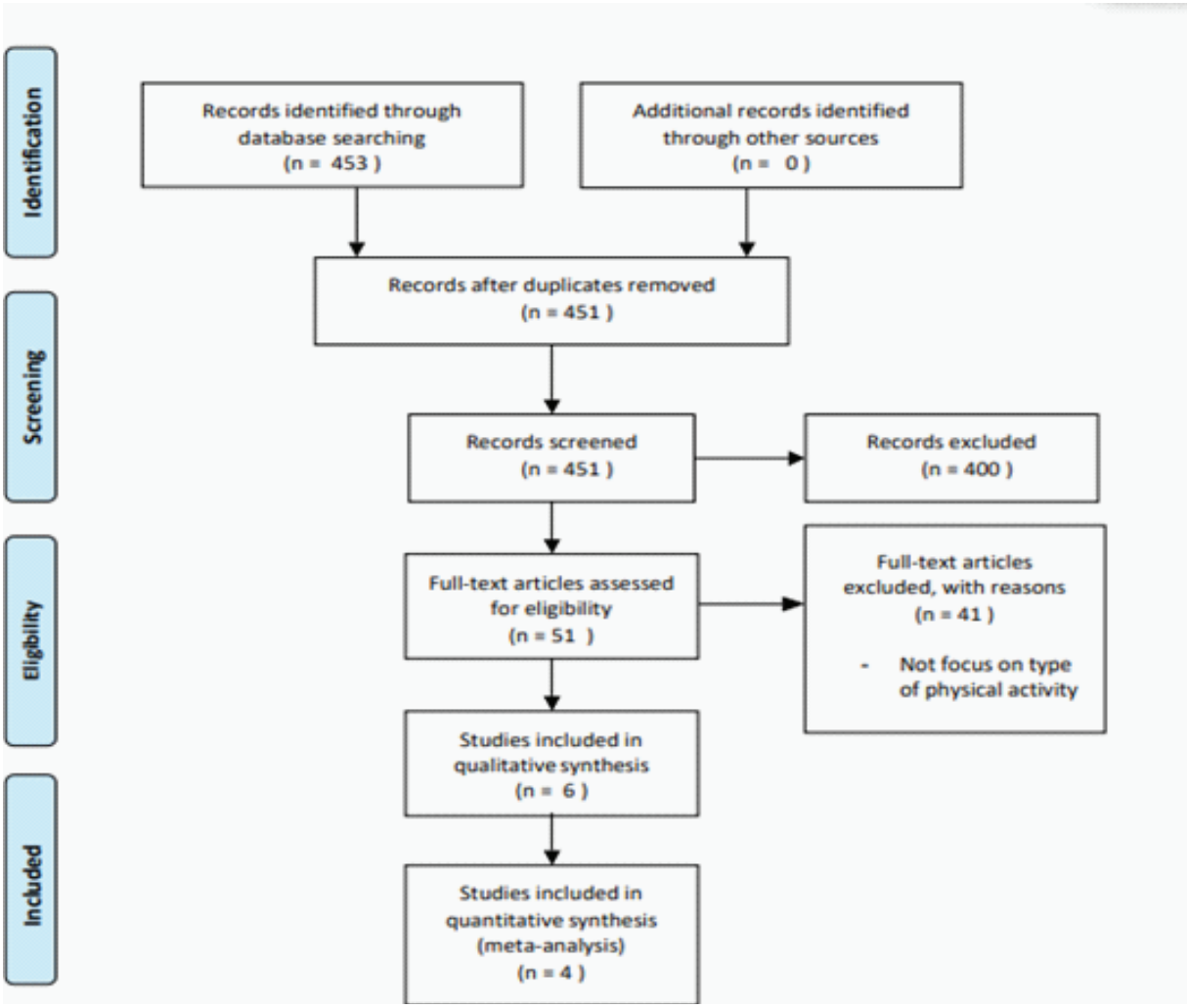
the type of physical activities or exercise for people with obesity which can be used for educating people in the community about physical activities that can be done amid a pandemic

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 of all 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 were used in the review.

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



Picture 1. Prism Flowchart

Results

The total of searches of the selected 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 their review. (Table 1)

Table 1. Purpose in the Study Selections

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Study	Objectives
Morales et al, (2021), Spain	Encourage physical exercise and maintain a healthy status for people of all ages with chronic diseases, such as obesity.
Wang et al, (2020), Hong Kong	Provide evidence in support of exercise management as a preventative strategy for improving health and minimize the effects of COVID-19.
Hossein et al, (2021), Iran	Evaluate the effects of low-intensity exercise and breathing exercises on cardiorespiratory responses and physical status in an overweight 20-year-old woman infected with COVID-19.
Hudson et al, (2020), USA	Provide information about physical activity for people with obesity and chronic disease.
Christina et al, (2021), USA	Provide information about physical activity and its role to prevent and mitigate COVID-19 infections in people with obesity.
Naran et al, (2020), Pennsylvania	Evaluate the impact of COVID-19 restrictions on bariatric surgery patients and assess their concern about COVID-19 in continuing the preoperative process.
Lim et al, (2020), South Korea	Provide a South Korean perspective which may give some explanations for these behavioral changes and related health consequences.
Kim et al, (2021), South Korea	Investigate the alteration of laboratory results (e.g. liver enzymes, lipid profile, and hemoglobin A1c; HbA1c) according to the reduction in physical activity in pediatric patients with obesity.
Minsky et al, (2021), Israel	Provide progressing obesity care during future quarantines in order to advance weight loss and prevent weight gain by physical activity.
Füzéki et al, (2020), London	Review summarizes harmful effects of limited physical activity on mental and physical health due to social distancing and quarantine

Table 2. Types of Research and Sample Used in the Study Selections

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

Study	Sample	Methodology
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 paediatric obesity patients	Retrospective observational study
Minsky et al, (2021), Israel	279 adults treated in hospital-based obesity clinics	Cross-sectional study
Füzéki et al, (2020), London	The general population, Including Obese people	Case Report

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 that 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 of NCD (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 are 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).

It is suggested that physical inactivity is the strongest predictor for obesity (Hamer et al., 2020). However, physical activity level significantly decreased during the COVID-19 lockdown. Moreover, research showed that only a reduction in physical activity level significantly predicted weight gain. Weight gain and metabolic syndrome are global crucial public health issues concerning sedentary behaviour during the recent COVID-19 pandemic (Dor-haim et al., 2021). To prevent the increase of chronic disease in the community due to physical inactivity during pandemics many healthcare professionals and health experts perform re-modification of physical activity (Table 2).

Table 3. Physical Activity Intervention from Separated 10 Articles

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.

Study	Intervention
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 adequate 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).

Table 4. Physical Activity Recommendation (Frequency, Intensity, Duration, and Type) for People with Obesity

Study	Findings
Morales et al, (2021), Spain	Vigorous-Physical Activity (V-PA) is only recommended for trained individuals. For vulnerable groups such as obesity, (Moderate-Physical Activity) 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

Study	Findings
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

Table 4. Physical Activity Recommendation (Frequency, Intensity, Duration, and Type) for People with Obesity

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 (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 the protocols and participant limits in class, but online classes can also be a good alternative The use of the 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). In addition, 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). Vigorous-Physical Activity (V-PA) such as walking up the stairs, skipping, and jumping is only recommended for trained individuals. For vulnerable groups such as people with obesity, Moderate-Physical Activity (M-PA) such as playing tennis, gardening, and dance is recommended (Morales & Riera, 2021). Aerobic training is more effective in reducing visceral and liver fat and total abdominal fat compared to resistance training (Wang et al.,

2020). However (Füzéki et al., 2020) excessive exercise (high volume high-intensity training) is not recommended because 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. During COVID-19 pandemic, however increasing physical activity is a challenge. It require some creativity, even for the most motivated and high awareness of health 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 consult your condition to a health professional.

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