



EFEK TELE-EXERCISE DIBANDINGKAN DENGAN KOMBINASI TELE-EXERCISE DAN TELE-COUNSELING TERHADAP PENURUNAN BERAT BADAN PEKERJA OBESITAS

Effect of tele-exercise versus combination of tele-exercise with tele-counseling on obese office employee's weight loss

Mury Kuswari¹⁾, Rimbawan Rimbawan^{1)*}, Hardinsyah¹⁾, Mira Dewi¹⁾ Nazhif Gifari²⁾

¹ Department of Nutrition Science, Faculty of Human Ecology, IPB University, Bogor, Indonesia;

² Department of Nutrition Science, Faculty of Health Sciences, Universitas Esa Unggul, Jakarta, Indonesia

Email korespondensi: rimbawan@apps.ipb.ac.id

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ABSTRACT

Obesity is one of five death risks globally. This is worsened by the increasing sedentary nature of work, where adults spend most of their time. The ongoing COVID-19 pandemic causes many employees to work from home. Online exercise in home or tele-exercise may potentially manage this. The purpose of this study was to analyze the effectiveness of tele-exercise on decreasing body weight of obese employee, or if it must be combined with nutrition tele-counseling. The design of this study is Pre-Post-Test Quasi-Experimental. This study was conducted on obese office employee in Jakarta with two intervention groups, one who receive tele-exercise intervention and the other who receive tele-exercise and nutrition tele-counseling. Subjects were divided into tele-exercise (n=25) and tele-exercise and nutrition tele-counseling (n=38). Subjects received tele-exercise 30 minutes per session, three sessions per week for six weeks. Tele-counseling was done by WhatsApp application every day, consisting of balanced nutrition education and calorie restriction for weight loss. Paired t-test was done on subject's body weight before and after intervention. The group who received tele-exercise and tele-counseling experienced weight loss significantly with average bodyweight from 77.36±11.83 kg to 75.49±11.58 kg ($\Delta=-1.87$ kg, $p<0.05$), while the same didn't happen on another group ($\Delta=0.36$, $p>0.05$). This research showed that tele-exercise is not very effective on decreasing obese office employee's body weight, but must be combined with nutrition tele-exercise to achieve significant weight loss.

Keywords: Body weight, Tele-counseling, Tele-exercise, Obese employee

ABSTRAK

Obesitas adalah satu dari lima risiko kematian secara global. Masalah obesitas diperparah oleh meningkatnya sifat sedenter dari pekerjaan, saat orang dewasa menghabiskan sebagian besar waktu mereka. Pandemi COVID-19 yang masih melanda Indonesia sejak tahun lalu menyebabkan banyak pekerja yang *Work from Home* (WfH). Olahraga di rumah dengan metode daring atau yang biasa disebut dengan tele-exercise berpotensi menangani hal ini. Tujuan dari studi ini adalah menganalisis keefektifan tele-exercise dalam mengurangi berat badan dari pekerja yang obesitas, atau harus dikombinasikan dengan intervensi edukasi gizi. Desain penelitian menggunakan Pretest-Posttest Quasy Experiment

Design. Penelitian ini dilakukan pada karyawan yang menyandang status gizi obesitas di Jakarta, dan dibagi menjadi dua kelompok, yakni kelompok yang menerima intervensi tele-exercise (n=25) dan kelompok yang menerima kombinasi tele-exercise dan tele-counseling (n=38). Subjek mendapatkan intervensi tele-exercise latihan kombinasi selama 30 menit setiap sesi, tiga kali seminggu selama 6 minggu secara live. Edukasi gizi dilakukan dengan menggunakan media WhatsApp, yang terdiri dari edukasi gizi seimbang dan restriksi kalori untuk penurunan berat badan dan IMT, dan dilakukan setiap hari. Paired t-test dilakukan pada variable berat badan subjek antara sebelum dan sesudah intervensi. Kelompok yang menerima dua jenis intervensi mengalami penurunan berat badan dari rata-rata sebesar 77,36±11,83 kg menjadi 75,49±11,58 kg ($\Delta=-1,87$ kg, $p<0,05$), sementara hal yang sama tidak terjadi pada kelompok lainnya ($\Delta=0,36$ kg, $p>0,05$). Kelompok yang menerima intervensi Tele-exercise dan Tele-counseling mengalami penurunan berat badan secara signifikan, namun tidak pada kelompok intervensi Tele-exercise saja. Hal ini menunjukkan bahwa tele-exercise saja tidak cukup efektif dalam penurunan berat badan, namun harus dikombinasikan dengan tele-counseling gizi.

Kata kunci: Berat badan, Pekerja gemuk, Tele-counseling, Tele-exercise

INTRODUCTION

Obesity is one of the five biggest risks of death globally, contributing to 5% of death worldwide. In high-income countries, obesity is a third biggest leading cause of disability-adjusted life years. Increasing BMI is also associated with the risk of cardiovascular disease, type 2 diabetes mellitus, osteoarthritis, and cancer (World Health Organization, 2017). The prevalence of overweight and obesity in Indonesia is currently 34.1%, doubled in the last two decades (World Health Organization, 2017). This global obesity pandemic is causing WHO to target the stopping of increasing obesity (Popkin et al., 2012; Roth et al., 2004; Swinburn et al., 2011). In developing countries, the problem of obesity is worsened by the sedentary nature of work (Cawley, 2011), that is when adults spend most of their time (Baicker et al., 2010). Also, some office employee population is exposed to

obesity-related work stressors, including night shift, (Karlsson et al., 2003), work pressure (Georges et al., 1992), and the length of working duration (Belkić & Nedic, 2007).

WHO recommends employers to do a health promotion program in their workplace, that can provide population-level intervention (World Health Organization, 2017). CDC (*Center for Disease Control*) recommends multicomponent intervention including nutrition intervention and physical activity intervention to reduce obesity (Katz et al., 2005). However, the ongoing COVID-19 pandemic in Indonesia since last year is causing many employees to *Work from Home* (WfH), which potentially may cause the increase in overweight and obesity prevalence. In response to the aforementioned problem, (Chen et al., 2018) recommend people to do exercise at home without changing their exercise routine. Tiksnadi et al. (2020) recommended people to maximize

their home exercise with the online method or commonly referred to *tele-exercise*. Tele-exercise comes from the prefix tele-, meaning from over a long distance (Cambridge University Press, 2020), and exercise. Specifically, tele-exercise is described as exercise facilitated through the use of video conferencing technology where individuals “meet” live via a laptop/television, and exercise with an instructor and classmates (Wu et al., 2010).

The purpose of this study is to analyze the effectiveness of tele-exercise on decreasing the bodyweight of an obese office employees, or if it must be combined with nutrition counseling and education intervention, as recommended by some researchers (Anderson et al., 2001; Jensen et al., 2014; Thom & Lean, 2017; Wing & Phelan, 2005). As far as we know, this is the first study that compare the effectiveness of tele-exercise intervention vs. combined tele-exercise and nutrition counseling in office obese employee in Indonesia, while the prevalence of obesity in office employee is still threatening.

METHODS

The design of this study is *Pretest-Posttest Quasy Experiment Design*. This research was carried out from June to August, 2020, on obese office employee working in Jakarta, Indonesia. The inclusion criteria are as follows: 18-45 years of age, working as an officer, does not have a coronary heart disease

or other serious illnesses that may be worsened by doing exercise, not commuting by walking more than 2 km or using bicycle, not having constraint on doing high-intensity workout, does not follow a specific diet, and willing to follow the research completely without pressure and/or coercion from other people. While the exclusion criteria are as follows: having a chronic diseases, currently not pregnant, or having an injury. Total sampling method was utilized in this research, since the population of this research is under 100 people. This research was done on two group: tele-exercise intervention group and tele-exercise + nutrition tele-counseling group. The subjects of this study are overweight and obese male and female office employees, with BMI 25-30 kg/m². Subjects were divided into tele-exercise (n=25) and tele-exercise and nutrition tele-counseling (n=38). All subjects followed this research completely/ until the end of this study. Tele-exercise intervention was given for as long as 30 minutes per session, three sessions per week, for 6 weeks. Tele-exercises intervention was given online, done in every subject’s laptop/ computer.

Nutrition education was done daily using WhatsApp media, comprised of balanced nutrition education and calorie restriction for weight loss and BMI improvement. Individualized tele-counseling was done twice a week by an experienced nutritionist, also using WhatsApp.

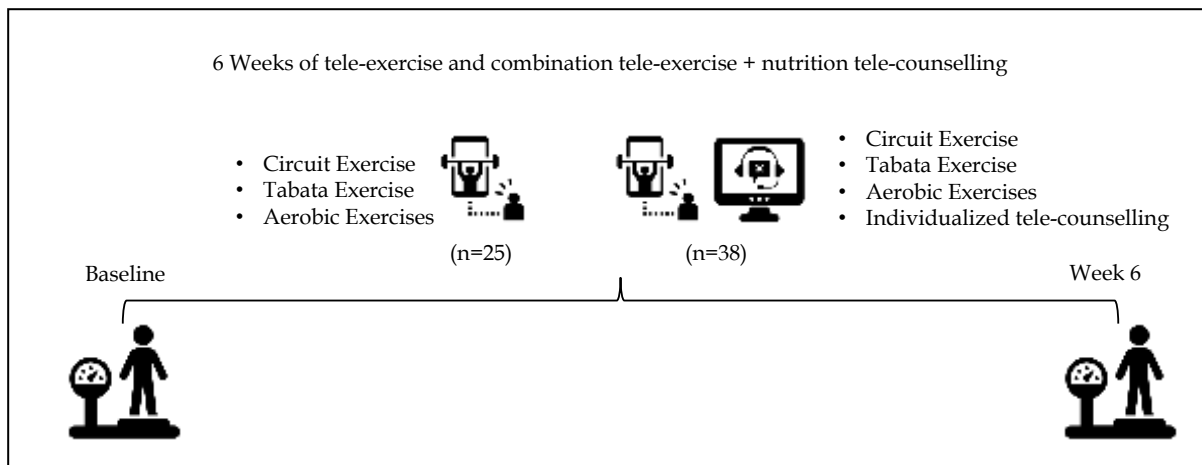


Figure 1.
Study design

Exercises were done proportional to each subjects' ability, guided by a professional fitness coach and trainer. The tele-exercises intervention was done using Zoom application and consisted of strength training (circuit exercise and Tabata exercise, three sessions a week) and aerobic exercises (low-to-moderate aerobic exercises and Zumba, once a week). Every session of exercises was started by 2-5 minutes warm-up, followed by main exercises for 20-25 minutes, and ended by 2-5 minutes cooling down session. The length of exercise intervention was 6 weeks, with bodyweight assessment was done before and after an intervention.

Data collected were sample characteristics and bodyweight, assessed by interview methods and bodyweight scale, respectively, with weighing that was done in office. All data collection procedures follow COVID-19 prevention protocol: All subjects and enumerators are using a

face mask, keeping a distance of 2 meters minimum, and using hand sanitizer each time data was collected from a single subject. Measurement of bodyweight was done by trained nutritionists, utilizing Omron HBF 375 Karada Scan scale as a weighing tool. The accuracy of this scale was up to one decimal. Measurement was taken twice per measurement session.

The data then were entered, edited, and cleaned in Microsoft Excel 2013. Analysis of data was done using SPSS 26.0 for Mac. Kolmogorov-Smirnov test was utilized to see the data distribution. Paired sample t-tests were used to compare the average body weight before and after the intervention, while an independent sample t-test was used to compare the mean difference between each intervention group. This research was ethically approved with protocol number 20-10-1309 by Komite Etik Penelitian Kesehatan, Fakultas Kedokteran Universitas Indonesia.

Table 1.
Characteristics of subjects

Intervention	Mean Age	Male		Female	
		n	%	n	%
Tele-Exercise	34.77± 8.66	3	12.00	22	88.00
Tele-Exercise + Tele-Counselling	37.85± 10.5	10	26.32	28	73.68

RESULTS

Characteristics of subjects was shown in Table 1. Most of subjects were female in both intervention group. Mean age for subjects in tele-exercise only intervention group was 34.77± 8.66 years, while mean age for subjects in combined group were 37.85± 10.5 years. Table 2 shows that there was a weight loss after the intervention was done. There was a significant decrease in weight loss on the combined (tele-exercise + nutrition tele-counseling) intervention group ($p < 0.05$), while weight loss in tele-exercise group only was not significant ($p > 0.05$). There was a significant difference in weight loss between each group ($p < 0.05$).

DISCUSSION

This research aimed to test the effectivity tele-exercise and nutrition tele-counseling technology on weight

loss of obese office employees. There was no significant weight loss for the intervention group who received only tele-exercise, while the group who received both tele-exercise and nutrition tele-counseling intervention loss their weight significantly. This proved that tele-exercise only did not cause weight loss, but must be accompanied by nutrition education.

The use of online-based weight loss programs is gaining popularity recently. Many media introduced in the last three decades such as hand phone, short message service, email and live video showed promising results for weight loss (Das et al., 2017; Hutchesson et al., 2014; Neve et al., 2010). Other research showed that weight management programs were effective in providing feedback from subjects, but there was not enough research that analyzed the effect of tele-exercise (Neve et al., 2010).

Table 2.
Mean differences of bodyweight on different intervention groups

Intervention	Average Bodyweight (kg)			p-value
	Before	After	Δ	
Tele-Exercise	58.82±10.31	58.78±10.43	-0.036±1.19	0.88 *
Tele-Exercise + Tele-Counseling	77.36±11.83	75.49±11.58	-1.87±2.05	0.0001 *
p-value			0.0001 **	

*Paired t-test of mean bodyweight before and after intervention

**Paired t-test of mean bodyweight differences after intervention between two groups

In this research, subjects who received both treatments had more positive feedback since they received individualized counseling. McTigue et al. (2009) studied the approaches of weight management programs in a virtual setting. Subjects of the aforementioned research that complete the program lost their weight significantly (4.8 kg on average) after 12 months and gained significant improvements on health metabolic markers (McTigue et al., 2009).

The significant weight loss that was happening in that combined intervention group was caused by nutrition education and counseling intervention. Nutrition education intervention, if combined with exercises was proven to be able to decrease percent body fat (Avisa et al., 2021) and improved blood lipid profile (Gifari et al., 2021). This combination was also able to improve BMI, which was determined by body weight (Gifari, Kuswari, et al., 2021); and even able to improve fitness level (Kuswari et al., 2020). Nutrition education provided positive effects on weight loss (Aldana et al., 2005; Calderon et al., 2008), since in counseling sessions, subjects had a greater knowledge on proper diet to induce weight loss. The nutrition tele-counseling session, nutritionist gave their individualized feedback to guide subjects on positive behavioral change. Even though it is known that self-monitored weight loss is the most common reason for someone to download mobile app

related to fitness or purchase Health devices (Blomfield et al., 2014; Mattila et al., 2008; Neve et al., 2010; Rivera et al., 2016). Also, the act of someone in putting their health-related information on the aforementioned mobile applications provided instant feedback. Without direct feedback from the health service providers, self-monitored weight loss was often not enough to induce behavioral changes and support subjects' engagements with their original reason and intention when that they set first on the start of a weight loss program (Rivera et al., 2016). All of those were proven in this study. No direct feedbacks that were going on in tele-exercise only intervention group may not cause a direct behavioral change that led to a decline in weight loss.

However, this can't all be attributed to the type of intervention only. Much electronic-based or online-based weight management programs were low in their compliance level and engagement to purpose level (Norman et al., 2007). On the intervention group who received combined treatment, the compliance level was higher (63%) than those who received tele-exercise only (24%). Significant weight loss in this group, with a high level of compliance, supports the usage of combined intervention in the workplace setting. Moreover, this also proved that the use of this combined intervention was as effective as primary and community programs (Leahey et al., 2015; Thomas et al., 2015; Wing et al., 2010).

SUMMARY

A combination of tele-exercise and nutrition tele-counseling was proven to be able to induce weight loss significantly for obese office employees. Tele-exercise alone was not able to induce weight loss for obese office employee, and may happen since its compliance level was low. Further research should include compliance level as a confounding factor in tele-exercise-based weight loss programs.

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