# ABSTRACT

**Background**: Cardiorespiratory is the ability of the respiratory and circulatory systems to supply oxygen during sustained physical activities. It is usually expressed as measured or estimated maximal oxygen uptake ($VO_2$ max). Aerobic physical activity that is more vigorous than lifestyle physical activities has been proven to increase cardiorespiratory health. On the other hand, resistance training also comes with the benefit of various health aspects, one of it being cardiorespiratory health. As humans grow older, deterioration of multiple physiological aspects is inevitable, including their body's ability to deliver oxygen within the body. This study aims to see whether Aerobic exercise combined with resistance training will impact the maximal oxygen consumption of elderly in Budi Dharma Nursing Home. **Purpose**: To determine the effects of aerobic exercise combined with resistance training on maximal oxygen uptake of elderly in Budi Dharma Nursing Home.
**Method**: There are 21 subjects that participated in the collection of data. Borg scale and PAR-Q Test will be used as an exclusive criteria. $VO_2$ max calculation will be obtained with 6 Minute Walk Test. The subject's blood pressure and heart rate will be measured before and after doing the 6 Minute Walk Test. This method of data collection will be done before and after the intervention. Statistical analysis method will be using paired t-test. **Result:** A total of 21 elderly met the eligibility criteria, and 17 participants completed the intervention. Predicted $VO_2$ max demonstrated a significant increase, rising from 17.96 to 19.08 ml/kg/min (mean difference = 1.12; $p$ = 0,003, one tailed). Both pre- and post-test data were normally distributed. Overall, the combined aerobic exercise and resistance training program led to meaningful improvements in functional capacity and predicted aerobic fitness among elderly.
**Conclusion**: The study demonstrated that the combination of aerobic exercise and resistance training effectively improved $VO_2$ max in the elderly population of Budi Dharma Nursing Home.
Keyword: Aerobic Exercise, Resistance Training, Maximal Oxygen Uptake, Elderly, Cardiorespiratory

# ABSTRAK

**Latar Belakang:** Kardiorespirasi merupakan kemampuan sistem pernapasan dan sirkulasi untuk menyuplai oksigen selama aktivitas fisik yang berlangsung terus-menerus. Kemampuan ini biasanya dinyatakan sebagai nilai maksimal konsumsi oksigen ($VO_2$ max) yang diukur atau diperkirakan. Aktivitas fisik aerobik dengan intensitas lebih tinggi dibanding aktivitas fisik sehari-hari terbukti dapat meningkatkan kesehatan kardiorespirasi. Di sisi lain, latihan resistensi juga memberikan berbagai manfaat kesehatan, termasuk terhadap fungsi kardiorespirasi. Seiring bertambahnya usia, terjadi penurunan berbagai aspek fisiologis, termasuk kemampuan tubuh dalam mendistribusikan oksigen. Penelitian ini bertujuan untuk mengetahui apakah kombinasi latihan aerobik dan latihan resistensi berpengaruh terhadap konsumsi oksigen maksimal pada lansia di Panti Wreda Budi Dharma.

**Tujuan:** Mengetahui pengaruh kombinasi latihan aerobik dan latihan resistensi terhadap $VO_2$ max pada lansia di Panti Wreda Budi Dharma.

**Metode:** Sebanyak 21 subjek berpartisipasi dalam pengumpulan data. Skala Borg dan tes PAR-Q digunakan sebagai kriteria eksklusi. Perhitungan $VO_2$ max diperoleh melalui Six Minute Walk Test (6MWT). Tekanan darah dan denyut jantung subjek diukur sebelum dan sesudah pelaksanaan 6MWT. Pengambilan data dilakukan sebelum dan sesudah intervensi. Analisis statistik menggunakan uji t berpasangan (paired t-test).

**Hasil:** Sebanyak 21 lansia memenuhi kriteria kelayakan, dan 17 peserta menyelesaikan intervensi. Hasil Six Minute Walk Test (6MWT) menunjukkan peningkatan bermakna, dengan rata-rata jarak meningkat dari 266,65 m menjadi 284,12 m (selisih rerata = -17,47 m; p = 0,005, satu arah). Nilai prediksi $VO_2$ max juga meningkat secara signifikan, dari 17,96 menjadi 19,08 ml/kg/menit (selisih rerata = -1,12; p = 0,003, satu arah). Data pre-test dan post-test berdistribusi normal. Secara keseluruhan, kombinasi latihan aerobik dan resistensi memberikan peningkatan bermakna terhadap kapasitas fungsional dan kebugaran aerobik terprediksi pada lansia.

**Kesimpulan:** Kombinasi latihan aerobik dan latihan resistensi efektif meningkatkan $VO_2$ max pada populasi lansia di Panti Wreda Budi Dharma.

**Kata kunci:** Latihan Aerobik, Latihan Resistensi, Konsumsi Oksigen Maksimal, Lansia, Kardiorespirasi