Perbaikan fungsi sel kadar telomerase, aktivitas GPx, kadar TBARS dan sistem kardiorespirasi (VO2maks serta kadar nox plasma akibat latihan aerobik intensias sedang selama 12 minggu pada perempuan lansia = Cell function repair telomerase levels, GPx activity, TBARS levels, cardiorespiratory system VO2max , and nox plasma levels due to moderate intensity aerobic exercise on elderly women

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Abstrak

ABSTRAK
Pertambahan usia dengan pola hidup sedenter akan meningkatkan radikal bebas yang menyebabkan disfungsi mitokondria dan pemendekan telomer secara progresif. Penelitian terdahulu menyatakan bahwa latihan aerobik intensitas sedang sangat direkomendasikan pada lansia karena mampu memperbaiki kerusakan oksidatif sel yang akan meningkatkan kebugaran serta memperpanjang masa hidup lansia. Penelitian bertujuan mengkaji peningkatan kadar telomerase, aktivitas GPx, kadar TBARS dan VO2maks sebagai penanda perbaikan fungsi sel dan sistem kardiorespirasi akibat latihan aerobik intensitas sedang selama 12 minggu pada perempuan lansia.Penelitian community trial control group pre test post test design dengan subjek lansia perempuan sedenter. Total subjek adalah 73 37 orang kelompok perlakuan dan 36 orang kelompok kontrol dipilih secara consecutive. Kemudian diambil subsampel berpasangan untuk pemeriksaan aktivitas GPx dan kadar TBARS. Subjek melakukan latihan aerobik intensitas sedang selama 12 minggu dengan frekuensi 3 kali seminggu, intensitas latihan 50 ndash;85 denyut nadi maksimal, 30 menit per sesi latihan dan jenis latihan berjalan. Pemeriksaan kadar telomerase, kadar NOx plasma dan aktivitas GPx menggunakan metode ELISA. Kadar TBARS menggunakan metode Wills, sedangkan prediksi VO2maks menggunakan uji latih 6 menit. Data diolah menggunakan uji t tidak berpasangan/uji Mann Whitney untuk melihat perbedaan rerata, uji Repeated ANOVA/Uji Friedmann untuk melihat perbedaan kemaknaan antar kelompok dan Uji Pearson/Spearman untuk melihat korelasi antar data.Kadar telomerase, prediksi VO2maks dan aktivitas GPx meningkat bermakna $p < 0,05$, sedangkan kadar TBARS cenderung terjadi penurunan $p < 0,05$ pada minggu ke-12 latihan. Penurunan kadar NOx plasma ditemukan lebih kecil pada kelompok perlakuan dibandingkan kelompok kontrol. Kadar telomerase berkorelasi positif dengan prediksi VO2maks dan aktivitas GPx serta berkorelasi negatif dengan TBARS. Pada penelitian ini perbaikan fungsi sel terjadi lebih dahulu melalui peningkatan kadar telomerase yang disertai peningkatan prediksi VO2maks terlihat pada minggu ke-6 latihan, selanjutnya terjadi perbaikan sistem sirkulasi TDS dan DN diikuti peningkatan prediksi VO2maks pada minggu ke-12 latihan menandakan bahwa latihan aerobik intensitas sedang jenis berjalan selama 12 minggu telah cukup mampu memperbaiki fungsi sel maupun sistem kardiorespirasi pada lansia. Kata Kunci: Latihan Aerobik Intensitas Sedang, NOx Plasma, Penuaan, Stres oksidatif, TBARS, Telomer, Telomerase, VO2maks.
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ABSTRACT
Increasing age in elderly with a sedentary lifestyle leads to increasing free radicals. Thus it causes mitochondrial dysfunction and progressive telomere shortening. The previous study suggested that

moderate-intensity aerobic exercise is highly recommended in the elderly people as it can repair cell oxidative damage. It improves the elderly people rsquo;s fitness and prolongs their life. This study aimed to assess increased telomerase levels, GPx activity, TBARS level and VO2max as a marker of the function of cell and cardiorespiratory system repair due to moderate intensity aerobic exercise for 12 weeks.This study was a community trial control group pre test post test design involved 73 volunter elderly women who are divided in two group: 37 subject experimental group and 36 subject control group. Each subject was selected based on consecutively inclusion and exclusion criteria . Then the paired subsample was taken before conducting a test on GPx activity and TBARS levels. Subjects performed the moderate-intensity aerobic exercise for 12 weeks with frequency three times a week, exercise intensity 50 ndash;85 of maximum pulse rate, 30 minutes per session, and type of walking exercise. Assessment of telomerase levels, plasma NOx levels, and GPx activity used ELISA method. The TBARS levels assessment applied the Wills method and the predicted VO2max using the 6-minute walked test. The data were analyzed using an unpaired t-test or Mann Whitney test to observe the mean difference, repeated ANOVA/Friedmann test to view the significant difference among the groups, and Pearson/Spearman test to find out the data correlation.Telomerase levels, predicted VO2max, GPx activity increased significantly $p < 0,05$ and TBARS levels tended to decrease at week 12 of exercise. Reduced plasma NOx levels were found to be smaller in the treatment group than in the control group. Telomerase levels positively correlated with predicted VO2max and GPx activity. On the other hand, telomerase levels negatively correlated with TBARS levels. The improvement of the function of cell occurs first through increased telomerase level accompanied by an increase predicted VO2max at week 6 of exercise, subsequent improvement of circulation system SBP and HR followed by an increase predicted VO2maks at weeks 12 of exercise. Moderate intensity aerobic exercise walking has been sufficient to improve the function of cell and cardiorespiratory system in elderly.Keywords: Aging, Moderate-intensity aerobic exercise, NOx Plasma, Oxidative stress, TBARS levels, Telomere, Telomerase, VO2max.