

ABSTRAK

Efek Penambahan *Elastic Taping* Pada Latihan Otot Inspirasi Dengan *Pressure Threshold IMT* Terhadap Kapasitas Fungsional Pelari Rekreasional Di Surabaya

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Latar belakang: Berlari menjadi tren baru olah raga rekreasional di Indonesia. Tujuh puluh persen pelari rekreasional kesulitan memperbaiki waktu tempuh karena *exercise-related transient abdominal pain (ETAP)* akibat kelelahan otot diafragma. Berbagai metode latihan telah dilakukan untuk meningkatkan kekuatan dan *endurance* otot diafragma, salah satunya dengan latihan *inspiratory muscle training/IMT*, sayangnya peningkatan kekuatan dan *endurance* otot respirasi yang didapatkan setelah latihan dengan *IMT* bervariasi. Diperlukan metode lain untuk mendapatkan efek latihan otot inspirasi yang optimal. Penambahan *elastic taping* pada dinding thorax bersamaan dengan latihan otot inspirasi menggunakan *pressure threshold IMT* potensial meningkatkan kapasitas fungsional seseorang.

Tujuan: Menilai efek penambahan *elastic taping* pada latihan otot inspirasi menggunakan *pressure threshold IMT* terhadap kapasitas fungsional pelari rekreasional. Kapasitas fungsional diukur menggunakan VO_{2max} , *rating of perceived breathlessness (RPB)* dan *rating of perceived exertion (RPE)*.

Metode: Subyek penelitian merupakan pelari rekreasional yang memenuhi kriteria inklusi dan tidak memiliki kriteria eksklusi (n=14). Subyek dibagi secara random ke dalam 2 kelompok, yaitu kelompok yang mendapat latihan otot inspirasi dengan *pressure threshold IMT* dan *elastic taping* dan latihan otot inspirasi dengan *pressure threshold IMT* saja. Pengukuran *RPB* menggunakan *Borg Dyspneu Scale*, *RPE* menggunakan *Borg Scale*, VO_{2max} menggunakan *Bruce treadmill Protocol* sebelum latihan dan setelah 4 minggu latihan. Frekuensi latihan nafas 2 kali sehari 30 repetisi, 5 kali seminggu dengan tahanan 60% 30 RM dilakukan di rumah kelompok penelitian, sedangkan frekuensi berlari 3 kali seminggu di atas EnMill® treadmill Serial Number ETB-03195 dengan kecepatan 4,5 mph inklinasi 0% di Instalasi Rehabilitasi Medik RSUD Dr. Soetomo Surabaya.

Hasil: Hasil penelitian ini menunjukkan penurunan *RPB* dan *RPE* dan peningkatan VO_{2max} pada kedua kelompok dengan nilai p berturut-turut 0,02; 0,02; dan 0,01. Tidak didapatkan perbedaan bermakna penurunan *RPB* dan *RPE* dan peningkatan VO_{2max} pada kedua kelompok dengan nilai p berturut-turut 0,31; 0,83 dan 0,13). Pengaruh besar penambahan *elastic taping* ($r^2=0,99$) tidak tercermin dari uji beda penurunan *RPB* dan *RPE* dan peningkatan VO_{2max} .

Kesimpulan: Latihan otot inspirasi dengan *pressure threshold IMT* dengan atau tanpa penambahan *elastic taping* selama 4 minggu meningkatkan kapasitas fungsional pelari rekreasional.

Kata kunci: *pressure threshold IMT*, *elastic taping*, pelari rekreasional, kapasitas fungsional, *RPE*, *RPB*, VO_{2max} .

ABSTRACT

Effects of Elastic Taping on Inspiratory Muscle Exercise with Pressure Threshold IMT on the Recreational Runner's Functional Capacity In Surabaya

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Background: Running is a new trend in recreational sports in Indonesia. About 70% of recreational runners have difficulty to improve exercise capacity due to exercise related transient abdominal pain (ETAP) caused by fatigue of the diaphragmatic muscles. The evidences have showed that various training methods may increase diaphragmatic muscle strength and endurance, such as inspiratory muscle training (IMT). Unfortunately, the improvement of inspiratory muscle strength and endurance after exercise and IMT are still varies. Therefore, other methods are needed to optimize the effect of IMT. The elastic taping to the thoracic wall during exercise allows the inspiratory muscles to contract optimally which might improve functional capacity. This study aims to assess the effect of elastic taping on inspiratory muscle training using the pressure threshold IMT to the functional capacity in recreational runners. Functional capacity is measured using VO_{2max} , rating of perceived breathlessness (RPB) and rating of perceived exertion (RPE).

Method: Our research was conducted for four weeks with approval by Ethics Committee of Dr. Soetomo Hospital Surabaya. Subjects recruited were 14 non smoker recreational runners age 20-40 years in Surabaya. Subjects were divided into two groups, pressure threshold IMT with elastic taping and pressure threshold IMT without elastic taping. The breathing exercises frequency were done twice a day, with 30 repetitions, five times a week, with resistance 60% 30 RM. The running frequency were done three times a weeks with a treadmill were carried out Outpatient Clinic of Physical Medicine and Rehabilitation Department of Dr. Soetomo Hospital Surabaya. The running speed was 4,5 mph with inclination 0%. Rating of perceived breathlessness (RPB) measurements using Borg Dyspneu scale, RPE measurement using Borg Scale, and VO_{2max} measurement using Bruce Treadmill Protocol test. The measurements are done before first exercise and after 4 weeks of exercise.

Results: The results of our study showed decrease of RPB and RPE and increase of VO_{2max} in both group with p values of 0.02; 0.02; and 0.01 respectively. There were no significant differences in the decrease of RPB and RPE and an increase of VO_{2max} in both groups with p values of 0.31; 0.83 and 0.13 respectively. The effect of the elastic taping ($r^2 = 0.99$) was not reflected in the difference of RPB, RPE and increasing VO_{2max} .

Conclusion: Inspiratory muscle training using pressure threshold IMT with or without the elastic taping for four weeks increases exercise capacity of recreational runners.

Keywords: pressure threshold IMT, elastic taping, recreational runners, functional capacity, *RPB*, *RPE*, VO_{2max} .