

RESPONS KARDIOVASKULER SEGERA, INTENSITAS AKTIVITAS FISIK DAN TINGKAT KESENANGAN SELAMA BERMAIN VIRTUAL REALITY EXERGAME

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Abstrak

Objektif: Aktivitas fisik dikaitkan dengan berbagai manfaat kesehatan, namun, populasi global tidak memenuhi rekomendasi aktivitas fisik yang ditetapkan. *Virtual reality exergaming* (VR EXG) dapat menjadi opsi alternatif untuk meningkatkan aktivitas fisik karena menyenangkan, relatif mudah diakses, dan dengan biaya yang terjangkau melalui perangkat *video-game* komersial populer. Studi pengukuran berulang ini bertujuan untuk mengetahui respon kardiovaskular segera (tekanan darah, denyut jantung), kuantifikasi intensitas aktivitas fisik (%HR_{max}, Skala Borg) dan tingkat kesenangan (skala analog visual/VAS) saat bermain VR EXG.

Metode: Lima belas pria dewasa sehat (usia 31,87±3,14, indeks massa tubuh 23,77±2,47 kg.m⁻²) menjalani tiga mode permainan "Fitness Boxing" Nintendo Switch™ dalam urutan yang sama: (1) bermain sendiri-tempo normal, (2) bermain sendiri- tempo cepat dan (3) versus. Selama bermain, denyut jantung subjek dipantau menggunakan Polar H10. Tekanan darah diukur sebelum dan sesudah bermain. Skala Borg dan VAS didapatkan setelah selesai bermain.

Hasil: Terdapat peningkatan signifikan denyut jantung dan tekanan darah sistolik ($p = 0,001$) pada ketiga kondisi bermain, sedangkan tekanan darah diastolik relatif konstan ($p > 0,05$). Skala Borg pada kisaran 12-13 (intensitas sedang) dan %HR_{max} antara 72-81% (intensitas berat). Tingkat kesenangan terbesar dalam mode versus dibandingkan mode bermain lainnya

Kesimpulan: VR EXG "Fitness Boxing" Nintendo Switch™ menghasilkan respons kardiovaskular segera, dengan intensitas sedang-berat pada pria dewasa sehat, dan dapat digunakan untuk meningkatkan rekomendasi aktivitas fisik mingguan.

Kata Kunci: *exergame*, intensitas aktivitas fisik, nintendo switch, respons kardiovaskular, tinju, tingkat kesenangan, *virtual reality*

IMMEDIATE CARDIOVASCULAR RESPONSES, PHYSICAL ACTIVITY INTENSITY AND ENJOYMENT LEVEL DURING VIRTUAL REALITY EXERGAME

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Objective: Physical activity has been associated with multiple health benefits, however, global population does not meet the physical activity recommendations. Virtual reality exergaming (VR EXG) can become alternative option to increase physical activity because it is fun, relatively easy to access and at affordable costs through popular commercial devices. This repeated measure study aims to investigate the immediate cardiovascular responses (blood pressure, heart rate), quantification of physical activity intensity (%HRmax, Borg's RPE) and the level of enjoyment (VAS) while playing VR EXG.

Methods: Fifteen healthy men (age 31.87 ± 3.14 , BMI 23.77 ± 2.47 kg.m⁻²) undergone three "Fitness Boxing" Nintendo Switch™ playing modes in the same order: (1) single player-normal tempo, (2) single player-fast tempo and (3) versus. During playing, subject's HR was monitored using Polar H10 heart rate sensor. Blood pressure measured before and after playing. Borg's RPE and VAS collected after playing.

Results: Our result showed significant heart rate and systolic blood pressure increase ($p = 0.001$) in all three playing conditions, whereas diastolic blood pressure is relatively constant ($p > 0.05$). The Borg's RPE were in 12-13 range (moderate) and %HRmax range between 72-81% (vigorous). The enjoyment level founds greatest in versus mode compared to other playing modes.

Conclusion: VR EXG Nintendo Switch™ "Fitness Boxing" can elicit immediate cardiovascular responses and provides an enjoyable moderate to vigorous intensity in healthy male adults, and can be used to increase the weekly physical activity recommendations.

Keywords: boxing, cardiovascular responses, enjoyment level, exergame, nintendo switch, physical activity intensity, virtual reality