

ABSTRAK

Penelitian ini bertujuan untuk membuat struktur model pembelajaran pendidikan jasmani berbasis kerja otak (*Brain-Based Physical Education Learning/ BBPEL*), kemudian membandingkan peningkatan kemampuan fungsi eksekutif, kadar BDNF serum dan prestasi akademis siswa yang mengikuti BBPEL dan pembelajaran pendidikan jasmani tradisional

Metode yang digunakan adalah mixed methode. Metode kualitatif digunakan untuk membuat struktur model pembelajaran BBPEL. Selanjutnya untuk membandingkan peningkatan kemampuan fungsi eksekutif, kadar BDNF serum dan prestasi akademis siswa yang mengikuti pembelajaran pendidikan jasmani tradisional dan BBPEL digunakan metode quasi eksperimen dengan disain *unequivalent control group design; pre-post test* untuk kemampuan fungsi eksekutif, dan *post-test only* untuk prestasi akademis dan kadar BDNF serum siswa. Subjek penelitian siswa SMP kelas VII sebanyak 39 orang. Perlakuan berlangsung 8 pertemuan. Fungsi eksekutif diukur dengan *stroop word-color test*, kadar BDNF serum diukur dengan metode ELIZA, prestasi akademis diambil dari nilai ulangan harian.

Hasil dari penelitian ini adalah terbentuknya struktur model BBPEL yang terdiri dari pembukaan, inti dan penutup. Pada pembukaan terdapat aktivitas gerak yang akan dipakai pada aktivitas inti, bersifat menstimulasi dan menaikkan mood. Pada inti siswa mendapatkan pilihan aktivitas gerak sesuai dengan kebutuhan personal, aman sekaligus menantang. Pada sesi penutupan terdapat permainan kooperatif semi kompetitif menggunakan aktivitas gerak yang sudah dipelajari. Lingkungan belajar, kondisi psikologis dan fisiologis siswa sepanjang pembelajaran mendapat perhatian khusus dan tertera dengan eksplisit pada struktur.

Terdapat perbedaan signifikan *gain-score* peningkatan kemampuan fungsi eksekutif antar kelompok BBPEL ($\bar{x}=17,4685$ detik) dan kelompok penjas tradisional ($\bar{x}=11,0237$ detik) $p= 0,043 < 0,05$. Kadar BDNF serum kelompok BBPEL ($\bar{x}=76085$ ug/dl) dan kelompok penjas tradisional ($\bar{x}=71792,6316$ ug/dl) tidak berbeda signifikan $p = 0,396 > 0,05$. Begitu pula prestasi akademis siswa antar kelompok kelompok BBPEL ($\bar{x}=82,05$) dan kelompok penjas tradisional ($\bar{x}=81,07$) tidak berbeda signifikan $p= 0,22 > 0,005$.

Kesimpulan. Pendidikan jasmani dapat memberi kontribusi positif pada fungsi eksekutif, kadar BDNF dan prestasi akademis, dan kontribusi tersebut untuk fungsi eksekutif dapat dioptimalkan dengan model pembelajaran BBPEL secara signifikan.

Kata Kunci: Model Pembelajaran Pendidikan Jasmani Berbasis Kerja Otak, fungsi eksekutif, , BDNF, prestasi akademis

ABSTRACT

This study aimed to develop a Brain-Based Physical Education Learning (BBPEL) model, and then to compare students' executive function performance enhancement, serum Brain-Derived Neurotrophic Factor and academic achievement after receiving BBPEL and traditional physical education classes.

The method used was mixed method. Qualitative procedure was used to develop BBPEL model structure. And then a quasi-experiment was used to test comparison between students executive function performance, BDNF and academic achievement from two unequivalent control groups. Participants were 39 students of 7th grade Junior High School students. Experiment duration was 8 weeks. Executive function ability was assessed using stroop word-color test, BDNF was measured using ELIZA technique and the academic achievement was gathered using school tests for mathematic, Bahasa and English.

BBPEL model structure consisted of introduction, core, closing session. For warming up in introduction session, physical activity movement used would be the one practiced in the core session. It was stimulating and lightening the mood. In core session, students had choices to do personally appropriate physical activity practices, save and also encouraging. In closing, there was mini cooperative and little competitiveness game using movement that was already learnt. Learning environment, students psychological dan physiological condition were maintained through the class and stated in the model structure.

Executive function performance enhancements before and after treatment gain-score between BBPEL group ($\bar{x}=17,4685$ second) showed significant differences $p=0,043 < 0,05$ to traditional group ($\bar{x}=11,0237$ second), while there were no significant differences $p=0,396 > 0,05$ between BBPEL group BDNF ($\bar{x}=76085$ ug/dl) to traditional group ($\bar{x}=71792,6316$ ug/dl) nor academic achievement $p=0,22 > 0,005$ between BBPEL group ($\bar{x}=82,05$) and traditional group ($\bar{x}=81,07$).

This study showed BBPEL model structure can accommodate physical activity intra curricular and brain-based learning principles. Physical education learning model structure can positively contribute on student executive function, serum BDNF and academic achievement; as for executive function, the BBPEL would optimize it significantly.

Keywords: Brain-Based Physical Education Learning, Executive Function, Brain-Derived Neurotrophic Factors, Academic Achievement