

## Effects of a Brisk-Walking Program on Anxiety, Depression and Self-Concept in Adolescents: A Time-Series Design

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**Abstract :** The anxiety and depression adolescents in Taiwan experience can cause suicide attempts and result in unfortunate deaths. An effective method for relieving anxiety and depression is brisk walking; a moderate and low intensity aerobic exercise, which uses large muscle groups rhythmically. The research purpose was to investigate the effects of a 12-week, school-based, brisk-walking program in decreasing anxiety and depression, and in improving self-concept among high school students living in central Taiwan. A quasi-experiment using the time series design (T1 T2 X T3 T4) was conducted. The Beck Youth Inventories 2 (BYI-II) Chinese version was given four times: the first time T1 was in the 4th week prior to intervention, T2 was in the intervention week, T3 was in the 6th week after the start of the intervention period and T4 was in the 12th week post intervention. The baseline phase of the time series constituted T1 and T2. The intervention phase constituted T2, T3, and T4. The amounts of brisk walking were recorded by self-report. The Generalized Estimating Equation (GEE) was used to examine the effects of brisk walking on anxiety, depression, and self-concept. The independent t-test was used to compare mean scores on three dependent variables between brisk walking over and less than 90-minutes per week. Findings revealed that levels of anxiety and self-concept had nonsignificant change during the baseline phase, while the level of depression increased significantly. In contrast, the study demonstrated significant decreases in anxiety and depression as well as increases in positive self-concept ( $p=.001$ ,  $p<.001$ ,  $p=.017$ ) during the intervention phase. Furthermore, a subgroup analysis was completed on participants who demonstrated elevated anxiety (23.4%), and depression (29.7%), and below average self-concept (18.6%) at baseline (T2). The subgroup of anxious, depressed, or low self-concept participants who received the brisk-walking intervention demonstrated significant decreases in anxiety and depression, and significant increases in self-concept scores. Participants who engaged in brisk walking over 90 minutes per week reported decreased mean scores on anxiety ( $t=-2.395$ ,  $p=.035$ ) and depression ( $t=-2.142$ ,  $p=.036$ ) in contrast with those who engaged in brisk-walking time less than 90 minutes per week. Regarding the effects on participants whose anxiety scores were within the normal range at baseline, there was demonstrated significant decrease in the level of anxiety when they increased their time on brisk walking before each term examination. Overall, the brisk-walking program was effective and feasible to promote adolescents' mental health by decreasing anxiety and depression as well as elevating self-concept. It also helped adolescents from anxiety before term examinations.

**Keywords :** adolescents, anxiety, depression, self-concept

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