Interventions for Increasing Physical Activity in Low-Income, Ethnic Minority Children and Youth: Meta Analysis
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Ethnic minority and economically disadvantaged children and youths often show high levels of risk and vulnerability to physical inactivity and health issues.

PURPOSE: To provide a better understanding of and examine the effectiveness of interventions to increase physical activity (PA) in children and youths from low-income families and ethnic minorities (LEMI) through a meta-analysis.

METHODS: We identified relevant studies through August 2017 from PubMed, Medline, CINAHL Plus, SportDiscuss, ERIC, PsychINFO, Scopus, ProQuest, and The Physical Activity Index. The main outcomes were the general PA levels and moderate-to-vigorous intensity of PA. Inclusion criteria applied were: (a) necessary statistics to compute effect sizes (ES); (b) PA intervention studies; (c) LEMI participants aged 3-12 years; and (d) full-text articles written in English and published in peer-reviewed journals. A random-effects model was used to estimate the ES. Furthermore, moderator analysis was conducted using five moderators: (1) intervention duration (<13, 13-47, >47 weeks); (2) participant age (<10, 10-12, >12 years); (3) intervention delivery (teacher, parents, teacher and parents, or specialists); (4) technology (used or not used); and (5) behavioral modification (used or not used). The ES were calculated using the Comprehensive Meta-Analysis 3.0. The ES were computed using Hedges g with 95% CI and the group difference was examined using the Q-statistic.

RESULTS: The results indicate that there were small to medium size of PA interventions on PA (overall ES = .325, 95% CI = .088, .561). Moderator analysis did not identify any significant differences across groups. However, ES for groups with less than 13 weeks (ES = .327, 95% CI = .163, .891, p = .005), participants aged 10-12 (ES = .540, 95% CI = .185, .895, p = .003), interventions delivered by specialist (ES = .335, 95% CI = .104,.966, p = .015), interventions without technology (ES = .367, 95% CI = .099, .634, p = .007), and interventions with behavioral modification (ES = .314, 95% CI = .046, .582, p = .022) were significantly different from zero.

CONCLUSION: The results from these studies indicate that interventions targeting increase in PA in LEMI children and youths were mostly successful with small to medium effects.

Standing Desk Intervention In Elementary School Children: Effects On Physical Activity And Sedentary Behavior
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Movement is very important for the growth and development of children. However, according to NHANES accelerometer data, children aged 6-11 years spend almost half of their day sedentary. Therefore, identifying ways to increase physical activity is important to the health of children.

PURPOSE: To determine the effect of replacing traditional sitting desks with standing desks on total daily sedentary behavior (SB) and physical activity (PA) in elementary school children.

METHODS: A 9- week within-classroom, controlled design, with teacher allocation to either a traditional seated desk (CON) or a standing desk (INT) was conducted during the first part of the school year. Baseline (September) and post assessments (December) included five consecutive weekdays of waking hour, hip-worn accelerometer (Actigraph GT3x+) assessments. Wilcoxon Rank Sum and Kruskal-Wallis Tests were used to detect significant between group differences (p<0.05) in changes in SB, light-intensity PA (LPA), and moderate-to-vigorous intensity PA (MVPA).

RESULTS: 22 third (8.5 ± 7y), 36 third (9.7 ± 5y) and 41 sixth (11.7 ± 4y) grade students completed the study and provided complete accelerometer data during the school day. During the intervention, students were exposed to the standing desks in the classrooms (homeroom time) for 19 minutes in the classroom, controlled design, with teacher allocation to either a traditional seated desk (CON) or a standing desk (INT) was conducted during the first part of the school year. Baseline (September) and post assessments (December) included five consecutive weekdays of waking hour, hip-worn accelerometer (Actigraph GT3x+) assessments. Wilcoxon Rank Sum and Kruskal-Wallis Tests were used to detect significant between group differences (p<0.05) in changes in SB, light-intensity PA (LPA), and moderate-to-vigorous intensity PA (MVPA).

RESULTS: The repeated measure ANOVA revealed a significant interaction between time x treatment in processing speed (F = 3.372, p = 0.038, η2 = 0.058), focused attention (F = 4.37, p = 0.015, η2 = 0.074), concentration performance (F = 13.53, p = 0.000, η2 = 0.197), and attention span (F = 8.04, p = 0.001, η2 = 0.128), but not in accuracy. Subsequently, the post hoc comparisons indicated that the CBPA group showed significant increases in processing speed (F = 6.876, p = 0.010), focused attention (F = 10.688, p = 0.002), concentration performance (F = 26.46, p = 0.000), and attention span (F = 14.090, p = 0.000) over the control, but not in accuracy. The CBPA group also showed significant improvement in concentration performance (F = 24.162, p = 0.000) and attention span (F = 6.891, p = 0.011), compared to the Fitbit-O. No significant changes in all five attention parameters were found between the Fitbit-O and the control.

CONCLUSIONS: As the school year progresses, there is a tendency for student to increase sitting and decrease PA. The introduction of the standing desk was shown to positively curtail these trends. Therefore, standing desks may be useful in preventing sedentary activity in elementary school classrooms, especially among younger children.

Impact Of Coordinated-bilateral Physical Activities On Attention And Concentration In School-aged Children
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PURPOSE: This study examined the effects of a 4-week, daily 6-minute coordinated-bilateral physical activity (CBPA) breaks in classroom on attention and concentration in school-aged children.

METHODS: 115 fifth graders from two elementary schools were assigned to three groups: two intervention groups (n = 60) and one control group (n = 56). Three groups were pre- and post-tested with the d2 Test of Attention, a cancellation test that measures students’ performance in attention and concentration. One intervention group (n = 31) participated in six minutes of daily coordinated-bilateral physical activity (CBPA) classroom break for four weeks. Another intervention group (n = 29), the Fitbit Only (Fitbit-O), wore Fitbits per day, five school days per week for four weeks without CBPA breaks. Processing Speed, Focused Attention, Concentration Performance, Attention Span, and Accuracy were used as parameters of attention performance for data analysis. The d2 Test had high test-retest reliability coefficients for all parameters, ranging from 95 to 98. A 2 x 3 ANOVA repeated measures were conducted, followed by the post hoc comparisons.

RESULTS: The repeated measure ANOVA revealed a significant interaction between time x treatment in processing speed (F = 3.372, p = 0.038, η2 = 0.058), focused attention (F = 4.37, p = 0.015, η2 = 0.074), concentration performance (F = 13.53, p = 0.000, η2 = 0.197), and attention span (F = 8.04, p = 0.001, η2 = 0.128), but not in accuracy. Subsequently, the post hoc comparisons indicated that the CBPA group showed significant increases in processing speed (F = 6.876, p = 0.010), focused attention (F = 10.688, p = 0.002), concentration performance (F = 26.46, p = 0.000), and attention span (F = 14.090, p = 0.000) over the control, but not in accuracy. The CBPA group also showed significant improvement in concentration performance (F = 24.162, p = 0.000) and attention span (F = 6.891, p = 0.011), compared to the Fitbit-O. No significant changes in all five attention parameters were found between the Fitbit-O and the control.

CONCLUSIONS: Engaging students in daily, highly-focused, coordinated-bilateral activities is an effective strategy to improve attention and concentration in school-aged children.

The Impact Of Stand-biased Desks On After-school Physical Activity Behaviors In Children
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PURPOSE: To assess changes in after-school time spent performing sedentary behavior (SB), light-intensity physical activity (LPA), and moderate- to vigorous-intensity physical activity (MVPA) among elementary school children in response to the introduction of stand-based desks in the classroom.

METHODS: Thirty-one fifth grade participants were assigned by their teacher to either a traditional (TD) (n=16) or stand-based (SBD) (n=15) desk. After-school PA and SB were measured using accelerometry on four consecutive weekdays at baseline (prior to introduction of the stand-based desks), and again following 9-weeks of exposure to either a TD or