PROMOTING HEALTHY LIFESTYLES

TEXAS ASSOCIATION HPERD JOURNAL

SUPPLEMENT TO VOLUME 91, NO. 2

TAHPERD Journal Supplement

2023 TAHPERD Annual Convention Research Abstracts

Posters Displayed December 1, 2023
Fort Worth Convention Center

SUMMER ISSUE 2023

Correlation Between the Development of Gross Motor Skills and Cognitive Advances in Early Childhood

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PURPOSE: The purpose of this study was to observe the correlation between the development of gross motor skills and the learning of academic skills in Pre-Kindergarten students. **METHODS:** Once receiving consent from the school district and the campus, each of the participant's parents and/or guardians provided consent allowing their child to participate in the study (n=43, age= 4±0.5 years, height= 101±7.5 cm, weight= 16±3.5 kg). After assigning each student with a number to keep his/her score confidential, using the GOLD Objectives for Development and Learning Assessment, each student was assessed on the two Gross Motor Skill Objectives (GMS) and the five Learning Objectives related to numeracy and literacy skills. The GMS (Objectives 4 & 5) were scored on a 3-point scale, while the Learning Objectives (Objectives 16 & 20) were scored on a 6 or 8-point scale as per the GOLD objectives. Microsoft Excel 2020 was used to analyze the data. Pearson's-Product Moment Coefficient (r) and Correlation were used to determine the strength of the relationship between the mean of the GMS and the mean of each learning objective. **RESULTS:** At the beginning of the school year (BOY), there was no relationship between GMS and numeracy skills $r_{(43)} = -0.191$, $p>0.5$; however, there was a moderate positive relationship between GMS and literacy skills $r_{(43)}=0.449$, $p>0.5$. In the second collection of data, during the middle of the school year (MOY), there was still no relationship between GMS and numeracy skills $r_{(43)} =0.122$, $p>0.5$, and a moderately positive relationship remained between GMS and literacy skills $r_{(43)} =0.486$, $p>0.5$. The last data collection during the end of the year (EOY), there was a moderate positive relationship between GMS and numeracy skills $r_{(43)} =0.422$, $p>0.5$, and the moderately positive relationship between the GMS and literacy skills continued to remain $r_{(43)} =0.488$, $p>0.5$. **CONCLUSION**: This study's findings suggest a moderate correlation between preschool students' gross motor skills and literacy skills and numeracy skills. However, because neither of the components exceeded the strength, $p>0.5$, thus leading to the rejection of the hypothesis. Although, a gradual increase in the strength of the correlation between the two components was observed over the school year.

Does Wearing a Squat Suit Increase Performance in Powerlifting?

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Powerlifting is a sport of relative and absolute maximal strength and includes three events: the *squat*, the *bench press*, and the *deadlift*. Competitors have three attempts in each of the three events to lift a maximal load in a single repetition while respecting judging criteria (Ferland & Comtois, 2019). A *One Repetition Maximum* (1RM) is the maximum amount of weight a person can lift at once (Wade, 1982). There are two styles of powerlifting: *Raw* and *Equipped. Equipped* lifting involves the use of special gear, such as *suits* for squatting while *raw* does not (Kozub & Brusseau, 2012). In the *equipped* division, competitors are also permitted the use of *supportive gear* such as squat suits, belts, knee wraps, bench shirts, chalk, and deadlift suits. The Texas High School Powerlifting Association (THSPA) identifies all gear that meet the guidelines for acceptable use during competition (http://www.thspa.us/). Previous research demonstrates *Raw* powerlifters lift significantly less than *Equipped* powerlifters (Ball & Weidman, 2018). The purpose of this study was to investigate whether the use of a squat suit in powerlifting enhances high school athletes' squat performance. Upon IRB approval, parent consent and student assent forms were issued and returned to their coaches. Powerlifters from four local high schools in south Texas entered their data on an online survey designed through Qualtrics. A total of 51 students (N=51; girls=19, boys=32) responded to the survey. A t-test conducted to compare the two categories of *Raw* and *Equipped* yielded a significant difference (p<.001) with *Equipped* yielding a higher load squatted than raw (Raw/Girls M=178.68 lbs.; SD=53.3*;* Raw/Boys M=396.88 lbs.; SD=106.1*;* Equipped/Girls M=221.84 lbs.; SD=65.6*;* Equipped/Boys M=465.94 lbs.; SD=129.7). This study indicates wearing the squat suit can increase the load squatted by approximately 20.75% (girls=24.1%; boys=17.4%). Findings in this study are similar to those of Ball & Weidman (2018) which indicates wearing a squat suit increases the maximum weight the body can load. Further research is needed in this relatively new sport to substantiate squat suit attributes. With the exponential growth of Texas high school powerlifting over recent years, as well as with its continued growth, high school coaches should consider the use of squat suits for increasing loads for their athletes. In furthering powerlifting knowledge, coaches should be aware that the positive benefits of wearing a squat suit will assist their athletes succeed and surpass other competitors in competition.

Key Words: *powerlifting, squat suits, equipped, raw, one repetition maximum, supportive gear*

High School Head Coaches' Coaching Efficacy by Degree Topic

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Statement of the Problem: High school head coaches in Texas generally must also be certified faculty members, but their professional teaching certification is focused on the classroom topic they teach, not what they coach. While coaching has been argued as a form of teaching, what is often overlooked is the extensive knowledge that goes into being an effective coach (ICCE, 2013; SHAPE America, 2019). Professional development opportunities exist (e.g. Coach Certification Program by University Interscholastic League and Texas High School Coaches Association), but without a strong foundation in coaching-related knowledge, it can be overwhelming to be able to implement concepts in one's own settings and contexts. Coaching efficacy is a measure to consider one's level of confidence in their ability to affect the learning and performance of their athletes (Myers et al., 2008). **Purpose:** The purpose of the study is to examine high school head coaches' coaching efficacy as it relates to the area of their degree. **Hypothesis:** Coaching efficacy will be greater in coaches with sport science-associated degrees than in non-sport science associated majors. **Methods:** Male and female head coaches from public high schools in Texas (n = 848) completed the Coaching Efficacy Scale II for High School Coaches (CES II-HST; SOURCE) via Qualtrics. The CES II–HST consisted of 18 items, split between five subscales: character building, game strategy, motivation, physical conditioning, and technical efficacy. Total Coaching Efficacy was calculated by averaging the 18 responses. **Results:** An independent t-test was conducted to evaluate the hypothesis that coaching efficacy would be significantly greater in individuals with a degree in sport science than other non-sport science related degrees. The test was significant, $t(848) = 3.57$, $p = <.001$. This result supports that the area of an individual's degree had a small effect ($d = .24$) on their coaching efficacy and favored the sport science associate degree. Results for all five subscales were also statistically higher for those coaches with degrees focused in sport science than those without. **Conclusion:** The sport science-related education a coach acquires through a higher education degree program is positively related to their confidence in their coaching abilities. Sports science degrees incorporate skills that contribute to successful coaching. Future research can investigate the impact of level of education and continuing professional development on coaching efficacy, as well as if higher coaching efficacy is related to more effective coaching behaviors.

The Associations of Moderate to Vigorous Physical Activity with Neuropsychological Function and Cardiovascular Risk Factors in Female Adults

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Statement of the Problem: In the United States, 22.3% of women aged 18-44 reported no physical activity or exercise (CDC, BRFSS, 2019-20) and 19.4% reported concerns of poor mental health (CDC, BRFSS, 2019-20). Reduced cognitive function is almost twice as common in inactive adults compared with those who are active, and physical inactivity is associated with a 24% higher risk of cardiovascular disease (Kivimaki, et al, 2019). The main purpose of this study was to examine the relationships of moderate to vigorous physical activity (MVPA < 60 mins vs. ≥ 60mins) with sedentary behavior, neuropsychological function (i.e., depressive symptoms and working memory), and cardiovascular risk indicators (e.g., resting heart rate (HR_{rest})

Methods/Procedures: Using a cross-sectional design, 28 female participants were recruited (M_{age}=29.56 ±12.807; 18.5% white). Participants used a validated survey to self-report depressive symptoms (CES-D; Radlof, 1977; Hann et al, 1999). They wore an accelerometer (Actigraph GT9X) for seven days to objectively monitor MVPA and sedentary behavior. Working memory and sensorimotor performance were assessed using the Cambridge Neuropsychological Test Automated Battery (CANTAB) tests for spatial working memory (SWMWE, SWMDE, and SWMXS) and motor screening (MOTML). Correlational analysis and an independent samples t-test were performed to examine the relationship and the group differences between individuals with MVPA < 60 mins vs. MVPA ≥ 60mins, respectively.

Results: Depressive symptoms and HR_{rest} were significantly correlated (Pearson's r = .348*). Significant negative correlations were found between SWM and average daily MVPA (Pearson's r =-.337* to-.355*), BMI (Pearson's r =-.353* to-.601**), and sedentary behavior time (Pearson's r =-.376*). It was found that individuals with MVPA ≥ 60mins had a better average HR_{rest} compared to individuals with MVPA < 60 mins (72.50 vs. 76.10; Cohen's d = 13.62) with a large effect size, but they also had more depressive symptoms (15.19 vs. 12.60; Cohen's d = 7.84) with a moderate effect size. The higher MVPA group also showed better performance (fewer errors) in SWMWE (0.53 vs. 2.50; Cohen's d = 3.29) and SWMDE (2.13 vs. 3.0; Cohen's d = 3.49), and lower reliance on strategy, indicating better memory performance in SWMSX (13.27 vs. 16.30; Cohen's d = 3.99) with a small effect size.

Summary of Findings: Results suggest that improving daily MVPA may be beneficial for decreasing cardiovascular health risks (HR_{rest}) but may not be beneficial for females with depressive symptoms. However, eliminating sedentary behavior time and improving daily physical activity may have a positive effect on executive function, especially working memory, among female adults.

Abstract Title: The Effects of Positive Action, a Character Curriculum, on the Social-Emotional Development of Elementary Students

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Statement of the Problem. Reduced peer interactions during the COVID-19 pandemic have contributed to higher rates of psychopathologies, suicide rates, and negative affect in elementary-aged children. Depression and anxiety are at an all-time high, and suicide is one of the leading causes of death in children ages 5-14 years. The current study examined the effects of Positive Action (PA), a character education curriculum, on the social and emotional skills of K-3 students from two school districts receiving 60 minutes of daily recess in addition to a 15-minute daily PA lesson.

Methods. The study sample included K-3 children (N=9,000): 4,500 children from a north Texas school district and 4,500 children from a central Texas school district. PA lessons focused on developing social-emotional learning (SEL) skills such as empathy, respect, honesty, trust, confidence, and self-esteem. Throughout the school year, teachers delivered the Positive Action 15-minute daily character development lessons and provided four 15-minute child-directed, outdoor recesses daily. At the end of each semester, SEL skills were tested using xSEL, a web-based computer assessment that examines four subscales in early elementary students: emotion regulation (understanding what others are feeling), social problem-solving (ability to think through social challenges), social perspective-taking (understanding others' thought and intentions), and self-control (ability to modulate thoughts and feelings to achieve a goal).

Procedures. School districts scheduled a specific week that teachers would collect xSEL data for their classes in both semesters. The teachers would take the children to the computer lab where they would sit at individual computers and respond to facial expressions and social situations on-screen that related to the four xSEL subscales. All questions were programmed the same for each child. The children could choose to take the assessment in Spanish or English. The test took approximately 25 minutes. Once completed, the assessment was submitted online directly to the xSEL database for data analysis. The data was accessible by the researcher once completed.

Results. The independent variables of the study were school district, age, and sex, and the dependent variables were the four xSEL subscales. A repeated measures MANOVA was used to determine score differences among the independent variables and change scores between Fall and Spring semesters. Results showed improved subscale scores by age but were similar between sexes across time. There were also score differences between the two school districts that may be attributable to the districts' different demographic compositions; these score differences were more pronounced in earlier grades, but became more similar as the children aged.

Summary of Findings. Children need more time in the school day to play and receive daily character guidance to develop their emotions and social skills. Positive Action is helping children get back on track developmentally; they are able to use the character lessons as a model to practice positive emotional and social skills with each other during recess and in the classroom.

The Influences of Neighborhood and Community Environmental Contexts on Obesity and Physical Activity among Adolescents

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Background/Purposes: Obesity is a leading cause of morbidity and premature mortality worldwide (An, 2015), and the incidence of obesity has been increasing rapidly all over the world in the past decades (Mohajan & Mohajan, 2023). Globally, 17% of adolescents are overweight or obese and almost 80% do not meet the recommended daily 60-mins moderate-to-vigorous physical activity (MVPA) (World Health Organization, 2019). Youth obesity and physical inactivity are independently linked to various immediate and long-term adverse health outcomes (e.g., sleep apnea, hypertension, heart disease, and mental disorders; U.S. Centers for Disease Control and Prevention, 2018). The Social Ecological Model (SEM) has been used as a theoretical framework guiding childhood obesity prevention and promoting physical activity during adolescence. The SEM emphasizes the importance of interactions among larger social, cultural, economic, and environmental contexts on individuals' health and behavioral changes (Sallis et al., 2006). Guided by the SEM model, the primary purpose of this study was to examine the relationships of neighborhood and community environmental contexts (i.e., neighborhood safety/crime, walkability, householder income, zip code), with obesity (i.e., Body mass index [BMI]), Leisure-Time PA (LTPA) and sedentary behavior (i.e., screen-based SB or non-screen-based SB) among adolescents.
Methods/procedures: Utilizing across-sectional research design, the parent-reported online survey was implemented during 2021-2022 in the North Texas region (N=283, M*age*=15; 66.4% female, 33.6% male; 54.3% household income < $50,000/year). The survey data collected information including parents/child demographics (i.e., ethnicity, age, gender), parental perceptions of their neighborhood/community environmental contexts, child's height/weight, daily LTPA, and SB. BMI was calculated from parents-reported height/weight and categorized based on the CDC index chart. Parent-reported zip code data were used to represent the risk proximity of a child's residence to the community environment.
Results: Around 32.4% of the participants were classified as overweight/obese and the majority of the participants were minorities (34.5% White). On average, participants engaged in approximately 7.43 hours of sedentary behavior and 34.84 hours of LTPA per week (~38.3% were classified as inactive youth). The correlation analysis showed that zip code was significantly correlated with BMI (r=-.23, p<.01), screen-based SB (r=-.35, p<.01), and non-screen-based SB (r=-.38, p<.01), but not with LTPA. The regression model showed that neighborhood safety/crime emerged as a significant predictor of BMI (β=.18, p <.05; R^2=16.8%) and LTPA (β=-.31, p <.01; R^2=16.8%), respectively. Both community walkability (β=-.16, p <.05) and zip code (β=-.26, p <.01) became significant predictors of overall SB, after controlling for other socio-demographics, contributing 25.8% of the variance in the model.
Conclusion: The findings of this study provided preliminary evidence on how to address modifiable environmental determinants of increased sedentary behavior and obesity prevention among youth. Increasing perceived neighborhood safety is recommended for PA promotion and maintaining a healthy weight, especially in the community with a higher proportion of low-income minorities. This project also provides insights that community or natural environment (e.g., walkability) enhancement may serve as an important constructional approach for eliminating sedentary behavior during adolescence. Specifically, it suggests that supportive state/federal health resources may be allocated more to vulnerable neighborhoods and communities such as high-risk natural disaster communities (e.g., flood-prone) or higher crime rate neighborhoods aimed at promoting physical activity and preventing childhood obesity.

Effects of Appropriate Instructional Practices on Social Emotional Learning in Physical Education

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Statement of the Problem: With the recent emphasis on social emotional learning (SEL) and its place in physical education, implementing the appropriate instructional practice (AIP) guidelines in PE programs can reinforce SEL for students. The purpose of this study was to examine the effects of appropriate instructional practices on students' social emotional learning in physical education based on the experiences of former K-12 PE students. **Methods and Procedures**: Participants (N = 18) were college students enrolled in a physical activity course at a private university in the Western United States who completed a paper survey created by one of the researchers. No participants were PE majors. The survey instrument was based on seven instructional practices identified from the literature and the questions were presented as seven scenarios to participants. Data were analyzed qualitatively. The researchers used a framework analysis methodology to analyze participants' open-ended responses and generate coding categories. **Results**: Seven categories related to AIP and participants' SEL in their former K-12 PE programs emerged from the survey responses: 1) Students working at their own pace were not afraid to make mistakes, 2) exercise as punishment, 3) captains picking teams, 4) making application from class activities, 5) working productively with a partner, 6) students being assessed in front of their classmates, and 7) publicly posting test results. **Summary of Findings**: Results from this study indicate that the appropriate instructional practice scenarios did affect former K-12 PE students' social emotional learning in PE class. It is important that K-12 PE teachers understand their part in implementing AIP in their lessons and activities.