

PHYSICAL ACTIVITY

Physical Activity Preferences of Overweight Fourth and Fifth Grade Students

Anne Larson, Christine Galvan, Yun Hsu, Kim Giron

Abstract

The purpose of this research was to contribute to the childhood obesity mitigation literature by determining the PA preferences of obese/overweight (o/o) elementary students who participated in Club Fit!, a school-based PA program designed to engage the students in developmentally appropriate, moderate-vigorous PA and enhance their regard for PA participation. An o/o intervention typically features PA engagement, but little is known about this population's preference tendencies. Because preference is a key motivator of PA participation, understanding preference parameters is valuable to intervention design. Each program session concluded with journaling, during which the students offered written responses to questions pertaining to that day's session. Journaling was an intentional program component for its ability to solicit information from the students that enabled the program directors to track their physical and emotional progress. Standard interpretive strategies were used to analyze the 1,396 journal entries produced over 1 academic year of program delivery that pertained to activity preference (e.g., What activity did you like? What activity do you want to do at home?). The top five most preferred activities were soccer, tag, PACER, basketball, and football. Further analysis indicated the stu-

Anne Larson is director, School of Kinesiology and Nutritional Science, California State University, Los Angeles. Christine Galvan is an associate professor, Department of Kinesiology, California State University, Long Beach. Yun Hsu is a graduate student, School of Kinesiology and Nutritional Science, California State University, Los Angeles. Kim Giron is a graduate student, School of Kinesiology and Nutritional Science, California State University, Los Angeles. Please send author correspondence to alarson2@calstatela.edu

dents mostly preferred traditional team sport activities and those that involved object control skills. The results suggest that o/o elementary students are similar to normal weight peers in their activity preference and WANT to participate in mainstream, traditional team sport and exercise activities. The results also indicate this population's preference to be treated like normal children vis-à-vis engagement in normal activities. Further investigation ought to delve more deeply into the nuances of preference (e.g., exploring different qualities of team sports), but these results can be useful toward informing the design of o/o intervention.

The childhood obesity/overweight (o/o) epidemic has professionals across multiple disciplines seeking effective mitigation. Over 30% of USA children and adolescents between the ages of 2 and 19 carry unhealthy weight (Ogden, Carroll, Kit, & Flegal, 2012). Approximately 12.5 million are obese, and statistically, over 50% will carry obesity into adulthood and raise children who will become obese (Freedman, Wang, & Thornton, 2009; Togashi et al., 2002).

Children with unhealthy weight face a litany of physical, emotional, and cognitive consequences. The physical consequence pervades all organ systems and includes high blood pressure, high cholesterol, type 2 diabetes, sleep apnea, asthma, liver damage, glucose intolerance, nonalcoholic fatty liver disease, bone density deficiency, gall bladder disease, and certain cancers (Bakker, Twisk, & Van Mechelen, 2003; Ball et al., 2008; Centers for Disease Control and Prevention [CDC], 2010; Must & Strauss, 1999; Weiss, Dziura, & Burger, 2004). As well, these children will likely develop osteoarthritis (Wearing, Hennig, Byrne, Steele, & Hills, 2006), are twice as likely than normal weight children to have arm and wrist fractures (Goulding, Cannan, Williams, Gold, & Lewis-Barned, 1998), and are predisposed to hip fracture risk as they age (Maffeis & Tatò, 2001). Their cardiovascular fitness is significantly compromised compared to that of normal weight children (Mastrangelo, Chaloupka, & Rattigan, 2009).

Common emotional and cognitive ramifications include low self-esteem, social ostracizing and isolation, poor body image, and being bullied (CDC, 2010; Nowicka et al., 2008; Pate, Health, & Dowda, 1996; Wang & Veuglers, 2008), which can precipitate risky behavior and depression that leads to significantly more suicidal

thoughts and actions than normal weight peers have (Strauss & Pollack, 2001; Whetstone, Morrissey, & Cummings, 2007). As well, compared to normal weight children, o/o children are academically deficient, more often absent, and more likely to exhibit behavior problems when in attendance (Coe, Pivarnik, Womack, Reeves, & Malina, 2012; Donnelly & Lambourne, 2011; Lumeng, Gannon, Cabral, Frank, & Zuckerman, 2003; Taras & Potts-Datema, 2005; Van Dusen, Kelder, Kohl, Ranjit, & Perry, 2011).

Research targeting the underlying cause of o/o has uncovered a complexity of contributory factors, including energy balance and a range of biologic and ecologic bases. Overweight children are significantly more screen active (e.g., watching TV, playing video games) and less physically active than are regular weight children (Anderson, Economos, & Must, 2008; Elder et al., 2010). A compelling biologic contributor is genetic predisposition. Children of overweight parents are more likely to become overweight than are children of normal weight parents (Elder et al., 2010). Ecologic reasons include low socioeconomic status (Humbert, Chad, Spink, & Muhajarine, 2006), living in underserved neighborhoods perceived to be unsafe (Gray et al., 2007), and offering few quality physical activity (PA) opportunities (U.S. Department of Health and Human Services, 2000). Compared to regular weight peers, overweight children fill time with screen activity because of less adult-structured “productive” activity (Gray et al., 2007), and they have (overweight) parents who set fewer limits on sedentary activities and provide less support to engage in PA (Elder et al., 2010).

Increasing PA is key to mitigation (Bulk-Bunschoten, Renders, Van Leerdam, & HiraSing, 2005; Strong et al., 2005), but multiple barriers hinder this population’s engagement, including low self-efficacy related to motor (sport) or fitness skills (Gillison, Standage, & Skevington, 2006; Lubans & Sylva, 2009; Welk & Joens-Matre, 2007), which is significant because self-efficacy is a key determinant of PA engagement. Motor skill competency, the “mastery of physical skills and movement patterns that enable enjoyable participation in physical activities” (Castelli & Valley, 2007, p. 359), predicts engagement—those who are motor skill competent are significantly more likely to engage in PA than are those who are less competent (Fisher

et al., 2005; Langley, 2006; Okely, Booth, & Patterson, 2001; Stodden & Goodway, 2007).

Skill competency, thus a pathway to regular PA, is developed through skill practice (Stodden & Goodway, 2007). Overweight children feel incompetent about PA participation (Langley, 2006), and research supports they tend to be low skilled (Duncan, Stanley, Ledington, & Wright, 2013). It is unclear if they are low skilled because they are inactive or they are inactive because they are low skilled, but the reluctance for active play pervades into adulthood (Kantomaa et al., 2011).

Despite engagement barriers, overweight children understand the importance of PA to well-being, want to increase their PA (Jansen, Mackenbach, Joosten-Van Zwanenburg, & Brug, 2010), and have done so when the activity environment

- uses a developmental approach to address skill acquisition (Alberga et al., 2013; Goldfield, Mallory, Prud'homme, & Adamo, 2008; Griffin, Meaney, & Hart, 2013; Meaney, Hart, & Griffin, 2009; Nye, 2008; Valentini, Rudisil, & Goodway, 1999; Wallhead, 2007),
- offers programming aligned to nationally recognized standards (treats the participants “normally”; Cale & Harris, 2006), and
- offers programming that reflects the participants’ preferences (Cale & Harris, 2006).

Purpose of the Study

Overweight children tend to be underactive; thus, increasing PA to establish healthy energy balance is a mitigation key. But the plaguing factors of low skill and lack of enjoyment complicate intervention effectiveness, with competency and enjoyment predicting engagement (Goldfield et al., 2008). Therefore, understanding the activity preferences of o/o children could inform intervention considering the significance of this variable to sustaining regular PA. The purpose of the study was to examine the activity preferences of o/o elementary students during Club Fit!, a school-based PA intervention program. The specific question that drove this research was, what are the PA preferences of o/o children? The researchers sought to contribute to the literature by addressing how a club for o/o chil-

dren identifies specific PA preferences. The affiliated university's IRB board approved this study.

Method

Club Fit! is a PA intervention program for o/o children and adolescents that has been conducted in school, after-school, and community-based settings. This research emerged from intervention conducted at a suburban Los Angeles elementary school of 505 students situated in a predominantly minority, low SES neighborhood in which the majority of students reside.

Club Fit! originated from the initiative of a health-related non-profit organization (NPO) serving the school's greater community. The NPO sought to address the obesity prevalence at this elementary school with which they had an established relationship. The NPO invited higher education kinesiology departments to submit intervention proposals. Our mid-sized public university is geographically convenient to the elementary school. Two Kinesiology faculty members, both pedagogy specialists with a youth development interest, codirected Club Fit!.

Participants

Club Fit! was delivered to 35 o/o fourth and fifth grade students twice weekly during the last instructional period of the school day for 60 min in 8-week sessions that followed the university's Fall, Winter, and Spring Quarters. The students were screened by the school nurse and/or nominated by the fourth and fifth grade classroom teachers. Students were chosen based on their need to become more physically active. The students ($N = 35$) were predominantly of Latino descent (97%). The objectives were to engage the participants in moderate-vigorous PA, to foster positive perceptions of PA participation, and to foster attributes of responsibility. Undergraduate pedagogy students aided delivery, so the participants received feedback, mentoring, and encouragement from multiple adults during each meeting. Prior to beginning each 8-week session, the codirectors oriented the undergraduate students to the program and outlined their responsibilities.

Teaching Format

Each Club Fit! meeting followed an intentional format to address each program objective appropriately. The format follows the framework used to teach personal and social responsibility (Hellison, 2003), which includes the following components:

- **Relationship time:** This time was used to work on student–teacher relationships. This provided the opportunity to get to know the students well. Informal conversations about school and home life occurred, and trust among the teachers and students was established. “Instant activity” options listed on a white board were used to engage students at the beginning of class (e.g., jump rope, play catch).
- **Awareness talk:** A discussion occurred on the topic of responsibility and how it is integrated into the lesson. The awareness talk set the tone and expectations for the class session. Students then moved into Dynamic warm-ups (e.g., tag games) and dynamic stretching before beginning the main learning experiences.
- **Lesson focus:** This phase was used to develop responsibility and skills. The majority of class time was spent here in skill practice and application. Skill practice from a developmental approach (Graham, Holt/Hale, & Parker, 2013) is a program pillar because motor skill proficiency can determine life span PA participation and successful participation motivates further engagement. The participants engaged in skill practice according to their proficiency level, which meant modifying activities as necessary to ensure success and then adding progressive challenge.
- **Group Meeting:** A debrief was conducted to ask students how they did as a group with regard to personal and social responsibility. Student voices were heard and the dialogue became focused on their level of responsibility and understanding of the content.
- **Reflection:** This was dedicated time for students to reflect on their individual involvement in the learning process. Each meeting concluded with journaling, for which each participant responded to three to five questions about their participation (e.g., What activity did you like best today?) and

aspects of responsibility (e.g., How did you help someone today?). “Journaling” labeled this component but not as a diary of self-selected topics, but rather as questions that referenced that day’s activities and occasionally activity beyond Club Fit! (e.g., What activity did you do at home?). A codirector provided specific feedback to the participants about their responses. The participants were so interested in reading these comments that when they received their journals, the students became notably quiet as they read the provided comments.

The majority of the children participated in all three 8-week sessions. The classroom teachers’ discretion about participation was the main fallout reason. The codirectors inquired about stoppage decisions but ceded involvement to the teachers. One participant chose to quit.

Data Collection

Each Club Fit! meeting concluded with the participants providing written responses to questions about that day’s Club Fit! and occasionally broader PA engagement. The student journals ($N = 1,536$) from one school year’s program sessions were collected to explore the participants’ activity preferences. This included 48 meetings that involved 61 unique students: 25 participated in all three 8-week sessions and 36 participated in one or two, producing 1,536 journal responses.

Data Analysis

The standard interpretive research analysis method of constant comparison drove data analysis (Miles & Huberman, 1994). Analysis began by the researchers determining that 1,396 responses related to questions about activity preference (e.g., What activity did you like? What activity do you want to do?). Each response was compared to previous responses and either added to a similar category (e.g., all responses that stated “basketball” were listed under basketball) or added as a new category. Next, each category of responses was tallied for frequency, which determined activity ranking from most to least indicated (thus most to least preferred).

The raw responses were also labeled according to activity type (team sport, individual/dual sport, or fitness) and the primary motor skill focus (object control/manipulation, locomotor, and nonlocomotor).

Reliability and Trustworthiness

To account for reliability and trustworthiness, the first author independently analyzed the journal responses to corroborate those determined to reflect activity preference. Second, a peer reviewer, a colleague of the first author otherwise not involved in the delivery or research of Club Fit!, validated how the responses were labeled according to activity type and primary motor skill focus. Two discrepancies about the activity type label emerged, which was resolved upon discussion between the first author and the peer reviewer.

Results

Club Fit! participants provided 1,396 responses about activity preference. Table 1 shows the 20 most to least preferred activities (of the 72 unique activities mentioned), showing strong preference for team sports (soccer, basketball, football, kickball), followed by nearly as strong a preference for fitness-related activity, specifically the PACER.

Table 1
Top 20 Most Preferred Activities

Activity	Number of mentions
Soccer	185
Tag (running games)	163
PACER	134
Basketball	134
Football	129
Kickball	94
Jump Rope	89
Walking/Jogging	41
Baseball/Softball	35
Jumping Jacks/Jumping (plyometrics)	30

Table 1 (cont.)

Activity	Number of mentions
Dance	25
Hula-Hoop	19
Handball	18
Swimming	16
Volleyball	16
Burn-outs (cardiovascular fitness activity)	14
Obstacle course	14
Skateboard	13
Bicycling	11
Frisbee	9

Table 2 displays activity preference according to activity type. Team sports were most preferred, followed by fitness activities (e.g., PACER).

Table 2*Activity Preference According to Activity Type*

Activity type	Occurrence
Team Sports	36
Fitness Activities	32
Combination	4

Table 3 displays activity preference according to the type of motor skill practice. Object manipulation skill activities were overwhelmingly preferred (e.g., throwing/catching, kicking), followed by locomotor activities (e.g., and nonlocomotor activities).

Table 3*Activity Preference According to Type of Motor Skill Practice*

Type of skill practice	Occurrence
Object Control	32
Locomotor	17
Nonlocomotor	12
Combination	11

Discussion and Implication

In this study, the researchers explored the PA preferences of o/o fourth and fifth graders who participated in a school-based intervention program. Previous research has uncovered some characteristics of effective intervention, but little is known about the PA preferences of this population. The results are valuable to intervention design because PA preference is key to motivated participation in PA.

First, the emergence of traditional team sports as overwhelmingly preferred suggests o/o children share a similar disposition to their regular weight peers in regard to activity preference—even though it may appear otherwise when o/o children are perceived as indifferent to, if not altogether disinterested in, activity engagement. This result fits with the suggestion that o/o children want to engage in culturally or environmentally mainstreamed sports/games (Rodenburg, Oenema, Pasma, Kremers, & van de Mheen, 2013) and WANT to participate in sports as the means to increase their activity level (Jansen et al., 2010). The participants may have been especially interested in soccer because of its prominence within the Latino culture. This is reasonable considering the accepted notion that activity preference is influenced by culturally mainstreamed sports. To note, it is possible that students participated at a higher level because of the use of the Responsibility Model. Students were taught to respect one another, regardless of skill level. They were also prompted to help one another.

Second, the emergence of traditional team sports as overwhelmingly preferred supports the suggestion that intervention content ought to be aligned to nationally recognized PA programming standards, and thus the participants are treated as “normal” (Cale & Harris, 2006). Traditional team sports and the skill development required to engage successfully underlie the K–12 curricular guidelines that have been established by professional organizations to yield a physically educated individual (SHAPE America, 2013). Although daily life for o/o children can be different from that of regular weight youth because of the condition affecting their physical, emotional, and cognitive function, treating them differently in the realm of PA might only exacerbate their social isolation and ostracizing (CDC, 2010; Nowicka et al., 2008; Pate et al., 1996). The result of traditional team sports as a predominant preference appears to

indicate o/o children no more want to be isolated from their regular weight peers than developmental experts suggest they should be (Robinson, 2006). It is possible that the use of the Responsibility Model allowed all children to feel a sense of belonging and to feel encouraged to participate regardless of ability. Also, quality physical education modifies instruction to meet the needs of all students. Both attributes were part of the Club Fit! program.

Third, the results also suggest that formal exercise (e.g., calisthenics, running) is not taboo. The participants indicated preference for numerous forms of formal exercise, and this is perhaps counterintuitive to intervention design. A top exercise favorite was the PACER test (running 25 yd back and forth on a time interval as many times as possible without missing the interval), which is used to measure cardiovascular fitness as an alternative to a timed distance run. Many overweight AND regular weight children prefer the PACER test to timed distance running, considering the PACER test to be more fun and less humiliating to those with low fitness by eliminating the public finishing order that characterizes timed runs (Blasingame, 2012; Meredith & Welk, 2010; Freedson, Cureton, & Heath, 2000; Wilkinson, Brown, Graser, & Pennington, 2012). The high preference for exercise may be surprising, but preference for the PACER test itself fits the suggestions that intervention ought to involve maximum participation (Green & Reese, 2006), minimize social comparison (Griffin et al., 2013), and be fun (Alberga et al., 2013).

Further, the motor skill focus and activity preference findings align and strengthen the suggestion that o/o children WANT to engage in sport-related PA. The participants were predominantly interested in object control activities (e.g., throwing, kicking), which complements the preference to play team sports. Team sport engagement is predicated by possessing adequate skill to negotiate the demands of a sport successfully. The findings suggest that the participants were especially motivated to practice the skills necessary to play the preferred sports, which also supports previous results that call for intervention to address skill acquisition (Alberga et al., 2013; Goldfield et al., 2008; Griffin et al., 2013; Meaney et al., 2009).

Finally, it appears that the developmental approach to activity delivery influenced activity preference. This bears mention consid-

ering self-efficacy is a significant correlate to engagement motivation (Zhang, Solomon, Goa, & Kosma, 2012) and the developmental approach intentionally targets motor skill self-efficacy by offering success-based skill practice. In accordance with the developmental approach, the participants never experienced basketball, for example, in its full-sided form, rather they experienced it with modifications to rules and space that aligned to their skill capacity. Yet basketball (and other similarly presented team sports) ranked highest on the preference scale. This aligns with current research suggesting intervention ought to feature a developmental approach to programming (Alberga et al., 2013; Goldfield et al., 2008; Griffin et al., 2013; Meaney et al., 2009) and supports the notion that an appropriate environment increases engagement (Griffin et al., 2013).

Further research ought to ascertain from o/o children how a developmental approach aids to neutralize engagement barriers. A developmental approach to programming may supersede the inclusion of any specific activity. In addition, although these results offer valuable information to practitioners designing intervention, they are but a glimpse into the population's activity preference. More studies would lead to reliable guiding principles and additional discernment according to varied demographics. Overall, it appears that those performing an intervention ought to avoid assuming that o/o children do not want to engage in mainstream sports/activities or formal exercise because of their size.

Limitations

First, past this context, generalized results cannot be assumed. Second, unforeseen factors may have influenced activity preference. For one, this region is home to a storied professional basketball team that endears an impassioned fan base, including many of the participants, who often wore team-branded sportswear. This may have been influential during the program session when the NBA season was in full stride and the team was doing well. Further, a state mandate requires that fifth grade students take the Fitnessgram fitness test and that the results be submitted to the state department of education. Many fifth grade teachers prepare students for the test throughout the school year, if by nothing else by reminding them it will be conducted. This factor may have heightened the fifth grade participants' awareness of exercise.

References

- Alberga, A., Medd, E., Adamo, K., Goldfield, G., Prud'homme, D., Kenny, G., & Sigal, R. (2013). Top 10 practical lessons learned from physical activity interventions in overweight and obese children and adolescents. *Applied Physiology, Nutrition, & Metabolism*, 38, 249–258. <https://doi.org/10.1139/apnm-2012-0227>
- Anderson, S., Economos, C., & Must, A. (2008). Active play and screen time in US children aged 4 to 11 years in relation to sociodemographic and weight status characteristics: A nationally representative cross-sectional analysis. *BMC Public Health*, 8, 366. <https://doi.org/10.1186/1471-2458-8-366>
- Bakker, I., Twisk, J., & Van Mechelen, W. (2003). Ten-year longitudinal relationship between physical activity and lumbar bone mass in (young) adults. *Journal of Bone Mineral Research*, 18, 325–332. <https://doi.org/10.1359/jbmr.2003.18.2.325>
- Ball, G., Lenk, J., Barbaric, B., Plotnikoff, R., Fishburne, G., Mackenzie, K., & Willows, N. (2008). Overweight children and adolescents referred for weight management: Are they meeting lifestyle behavior recommendations? *Applied Physiological Nutritional Metabolism*, 33, 936–945. <https://doi.org/10.1139/H08-088>
- Blasingame, K. (2012). *Measurement agreement of FITNESSGRAM aerobic capacity and body composition standards* (Master's thesis). Iowa State University, Ames. Retrieved from <http://lib.dr.iastate.edu/etd/12281/>
- Bulk-Bunschoten, A., Renders, C., Van Leerdam, F., & HiraSing, R. (2005). [Youth health care overweight-detection-protocol]. Woerden, Netherlands: Platform Jeugdgezondheidszorg.
- Cale, L., & Harris, J. (2006). School-based physical activity interventions: Effectiveness, trends, issues, implications for practice. *Sport, Education, and Society*, 11, 401–420. <https://doi.org/10.1080/13573320600924890>
- Castelli, D., & Valley, J. (2007). The relationship of physical fitness and motor competence to physical activity. *Journal of Teaching in Physical Education*, 26, 358–374. <https://doi.org/10.1123/jtpe.26.4.358>
- Centers for Disease Control and Prevention. (2010). Overweight and obesity: Consequences. Retrieved March 18, 2014, from <http://www.cdc.gov/NCCDPHP/DNPA/obesity/childhood/consequences.htm>

- Coe, D., Pivarnik, J., Womack, C., Reeves, M., & Malina, R. (2012). Health-related fitness and academic achievement in middle school students. *Journal of Sports Medicine and Physical Fitness*, 52, 654–660.
- Donnelly, J., & Lambourne, K. (2011). Classroom-based physical activity, cognition, and academic achievement. *Preventive Medicine*, 52, S36–S42. <https://doi.org/10.1016/j.ypmed.2011.01.021>
- Duncan, M., Stanley, M., Ledington, E., & Wright, S. (2013). The association between functional movement and overweight and obesity in British primary school children. *BMC Sports Science Medical Rehabilitation*, 5(11). <https://doi.org/10.1186/2052-1847-5-111>
- Elder, J., Arredondo, E., Campbell, N., Baquero, D., Duerksen, S., Ayala, G., . . . Mckenzie, T. (2010). Individual family and community environmental correlates of obesity in Latino elementary school children. *Journal of School Health*, 80, 20–29. <https://doi.org/10.1111/j.1746-1561.2009.00462.x>
- Fisher, A., Reilly, J., Kelly, L., Montgomery, C., Williamson, A., & Patton, J. (2005). Fundamental movement skills and habitual physical activity in young children. *Medicine & Science in Sports & Exercise*, 37, 684–688. <https://doi.org/10.1249/01.MSS.0000159138.48107.7D>
- Freedman, D., Wang, J., & Thornton, J. (2009). Classification of body fatness by body mass index-for-age categories among children. *Archives of Pediatric and Adolescent Medicine*, 163, 801–811. <https://doi.org/10.1001/archpediatrics.2009.104>
- Freedson, P., Cureton, K., & Heath, G. (2000). Status of field-based fitness testing in children and youth. *Preventive Medicine*, 31, S77–S85. <https://doi.org/10.1006/pmed.2000.0650>
- Gillison, F., Standage, M., & Skevington, S. (2006). Relationships among adolescents' weight perceptions, exercise goals, exercise motivation, quality of life and leisure-time exercise behavior: A self-determination theory approach. *Health Education Research*, 21, 836–847. <https://doi.org/10.1093/her/cyl139>
- Goldfield, G., Mallory, R., Prud'homme, D., & Adamo, K. (2008). Gender differences in response to a physical activity intervention in overweight and obese children. *Journal of Physical Activity and Health*, 5, 592–606. <https://doi.org/10.1123/jpah.5.4.592>

- Goulding, A., Cannan, R., Williams, S., Gold, E., & Lewis-Barned, N. (1998). Bone mineral density in girls with forearm fractures. *Journal of Bone and Mineral Research*, *13*, 143–148. <https://doi.org/10.1359/jbmr.1998.13.1.143>
- Graham, G., Holt/Hale, S., & Parker, M. (2013). *Children moving: A reflective approach to teaching physical education* (9th ed.). New York, NY: McGraw-Hill.
- Gray, V., Byrd, S., Cossman, J., Chromiak, J., Cheek, W., & Jackson, G. (2007). Family characteristics have limited ability to predict weight status of young children. *Journal of the American Dietetic Association*, *107*, 1204–1209. <https://doi.org/10.1016/j.jada.2007.04.004>
- Green, G., & Reese, S. (2006). Childhood obesity: A growing phenomenon for physical educators. *Education*, *127*, 121–124.
- Griffin, K., Meaney, K., & Hart, M. (2013). The impact of a mastery motivational climate on obese and overweight children's commitment to and enjoyment of physical activity: A pilot study. *American Journal of Health Education*, *44*, 1–8. <https://doi.org/10.1080/19325037.2012.749678>
- Hellison, D. (2003). *Teaching responsibility through physical activity* (2nd ed.). Champaign, IL: Human Kinetics.
- Humbert, L., Chad, K., Spink, K., & Muhajarine, N. (2006). Factors that influence physical activity participation among high- and low-SES youth. *Qualitative Health Research*, *16*, 467–483. <https://doi.org/10.1177/1049732305286051>
- Jansen, W., Mackenbach, J., Joosten-Van Zwanenburg, E., & Brug, J. (2010). Weight status, energy balance behaviours, and intentions in 9–12-year-old inner city children. *Journal of Human Nutrition and Diet*, *23*, 85–96. <https://doi.org/10.1111/j.1365-277X.2009.01027.x>
- Kantomaa, M., Purtsi, H., Viholainen, H., Rintala, P., Ahonen, T., & Tammelin, T. (2011). Suspected motor problems and low preference for active play in childhood are associated with physical inactivity and low fitness in adolescence. *PLoS ONE*, *6*(1). <https://doi.org/10.1371/journal.pone.0014554>
- Langley, B. (2006). *Determinants of physical activity of middle-school overweight girls: The effects of a wellness program* (Doctoral thesis). University of North Carolina, Greensboro. Retrieved from <https://libres.uncg.edu/ir/uncg/f/umi-uncg-1126.pdf>

- Lubans, D., & Sylva, K. (2009). Mediators of change following a senior school physical activity intervention. *Journal of Science and Medicine in Sport, 12*, 134–140. <https://doi.org/10.1016/j.jsams.2007.08.013>
- Lumeng, J. C., Gannon, K., Cabral, H. J., Frank, D. A., & Zuckerman, P. (2003). Association between clinically meaningful behavior problems and overweight children. *Pediatrics, 112*, 1138–1145. <https://doi.org/10.1542/peds.112.5.1138>
- Maffeis, C., & Tatò, L. (2001). Long-term effects of childhood obesity on morbidity and mortality. *Hormone Research, 55*, 42–45. <https://doi.org/10.1159/000063462>
- Mastrangelo, A., Chaloupka, V., & Rattigan, L. (2009). Complications of obesity in children and adolescents. *International Journal of Obesity, 33*, S60–S65. <https://doi.org/10.1038/ijo.2009.20>
- Meaney, K., Hart, M., & Griffin, L. (2009). Fun and fit, phase I: A program for overweight African American children from low-income families. *Journal of Physical Education, Recreation, and Dance, 80*, 35–39. <https://doi.org/10.1080/07303084.2009.10598338>
- Meredith, M., & Welk, G. (2010). *FITNESSGRAM & ACTIVITYGRAM test administration manual*. Champaign, IL: Human Kinetics.
- Miles, M., & Huberman, M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). New York, NY: Sage.
- Must, C., & Strauss, R. (1999). Risks and consequences of childhood and adolescent obesity. *International Journal of Obesity and Related Metabolic Disorders, 23*, S2–S11. <https://doi.org/10.1038/sj.ijo.0800852>
- Nowicka, P., Hoglund, P., Birgerstam, P., Lissau, L., Pietrobelli, A., & Flodmark, C. (2008). Self-esteem in a clinical sample of morbidly obese children and adolescents. *Acta Paediatrica, 98*, 153–158. <https://doi.org/10.1111/j.1651-2227.2008.01061.x>
- Nye, S. (2008). Fun club: A PA program for elementary students. *Journal of Physical Education, Recreation, and Dance, 79*, 36–44. <https://doi.org/10.1080/07303084.2008.10598117>
- Ogden, C., Carroll, M., Kit, B., & Flegal, K. (2012). Prevalence of obesity and trends in body mass index among US children and adolescents, 1999–2010. *Journal of the American Medical Association, 307*, 483–490. <https://doi.org/10.1001/jama.2012.40>

- Okely, A., Booth, M., & Patterson, J. (2001). Relationship of physical activity to fundamental movement skills among adolescents. *Medicine & Science in Sports & Exercise*, 33, 1899–1904. <https://doi.org/10.1097/00005768-200111000-00015>
- Pate, R., Heath, G., & Dowda, M. (1996). Associations between physical activity and other health behaviors in a representative sample of US adolescents. *American Journal of Public Health*, 86, 1577–1581. <https://doi.org/10.2105/AJPH.86.11.1577>
- Robinson, S. (2006). Victimization of obese adolescents. *The Journal of School Nursing*, 22, 201–206. <https://doi.org/10.1177/10598405050220040301>
- Rodenburg, G., Oenema, A., Pasma, M., Kremers, S., & van de Mheen, D. (2013). Clustering of food and activity preferences in primary school children. *Appetite*, 60, 123–132. <https://doi.org/10.1016/j.appet.2012.10.007>
- SHAPE America. (2013). National PE standards. Retrieved from <http://www.shapeamerica.org/standards/pe/>
- Stodden, D., & Goodway, J. (2007). The dynamic association between motor skill development and physical activity. *Journal of Physical Education, Recreation, and Dance*, 78, 33–34, 49. <https://doi.org/10.1080/07303084.2007.10598077>
- Strauss, R., & Pollack, H. (2001). Epidemic increase in childhood overweight, 1986–1998. *Journal of the American Medical Association*, 286, 2845–2849. <https://doi.org/10.1001/jama.286.22.2845>
- Strong, W., Malina, R., Blimkie, C., Daniels, S., Dishman, R., Gutin, B., . . . Trudeau, F. (2005). Evidence based physical activity for school-age youth. *Journal of Pediatrics*, 146, 732–737. <https://doi.org/10.1016/j.jpeds.2005.01.055>
- Taras, H., & Potts-Datema, W. (2005). Obesity and student performance at school. *Journal of School Health*, 75, 291–295. <https://doi.org/10.1111/j.1746-1561.2005.00040.x>
- Togashi, K., Masuda, H., Rankinen, T., Tanaka, S., Bouchard, C., & Kamiya, H. (2002). A 12-year follow-up study of treated obese children in Japan. *International Journal of Obesity and Related Metabolic Disorders*, 26, 770–777.
- U.S. Department of Health and Human Services. (2000). *Healthy People 2010: Understanding and improving health* (2nd ed.). Retrieved from <http://www.healthypeople.gov/2010/Document/tableofcontents.htm>

- Valentini, N., Rudisil, M., & Goodway, J. (1999). Incorporating a mastery climate into elementary physical education: It is developmentally appropriate. *Journal of Physical Education, Recreation, and Dance*, 70, 28–32. <https://doi.org/10.1080/07303084.1999.10605683>
- Van Dusen, D., Kelder, S., Kohl, H., Ranjit, N., & Perry, C. (2011). Associations of physical fitness and academic performance among schoolchildren. *Journal of School Health*, 81, 733–740. <https://doi.org/10.1111/j.1746-1561.2011.00652.x>
- Wallhead, T. (2007). Teaching K–12 students to combat obesity. *Journal of Physical Education, Recreation, and Dance*, 78, 26–28. <https://doi.org/10.1080/07303084.2007.10598074>
- Wang, F., & Veuglers, P. (2008). Self-esteem and cognitive development in the era of the childhood obesity epidemic. *Obesity Review*, 9, 615–623. <https://doi.org/10.1111/j.1467-789X.2008.00507.x>
- Wearing, S., Hennig, E., Byrne, N., Steele, J., & Hills, A. (2006). Musculoskeletal disorders associated with childhood obesity: A biomechanical perspective. *Obesity Review*, 7, 239–250. <https://doi.org/10.1111/j.1467-789X.2006.00251.x>
- Weiss, R., Dziura, J., & Burger, T. (2004). Obesity and the metabolic syndrome in children and adolescents. *New England Journal of Medicine*, 350, 2362–2374. <https://doi.org/10.1056/NEJMoa031049>
- Welk, G., & Joens-Matre, R. (2007). The effect of weight on self-concept, and psychosocial correlates of physical activity in youths. *Journal of Physical Education, Recreation, and Dance*, 78, 43–46. <https://doi.org/10.1080/07303084.2007.10598081>
- Whetstone, L., Morrissey, S., & Cummings, D. (2007). Children at risk: The association between perceived weight status and suicidal thoughts and attempts in middle school youth. *Journal of School Health*, 77, 59–66. <https://doi.org/10.1111/j.1746-1561.2007.00168.x>
- Wilkinson, C., Brown, L., Graser, S., & Pennington, T. (2012). Adolescent girls' preferences pertaining to cardiovascular fitness testing: A comparison between the one-mile run and PACER tests. *The Physical Educator*, 69, 52–70.
- Zhang, T., Solomon, M., Gao, Z., & Kosma, M. (2012). Promoting school students' physical activity: A sociological perspective. *Journal of Applied Sport Psychology*, 24, 92–105. <https://doi.org/10.1080/10413200.2011.627083>