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**Using SOFIT to Evaluate Child and Youth Recreational Programming**

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Evidence-based (EB) physical education (PE) programs are those that have been subjected to robust research to support improvements in health-related behaviours or outcomes (Lounsbury, McKenzie, Trost, & Smith, 2011). Unfortunately, little evidence exists from community-based physical activity (PA) programs (Pate et al., 2003; Pate et al., 2000). In fact, the majority of empirical evidence on child and youth PA habits comes from school-based PE interventions (Pate et al., 2000), yet less than half of children’s daily PA comes from participating in school PE (Brusseau et al., 2011).

Low enrolment and lack of desire to participate in PA may stem from programs that are not well designed or clearly understood. By measuring the amount of time instructors and participants spend on appropriate tasks, an understanding of programs can be created. In addition, creating positive environments could encourage children to participate more fully in PA and carry that motivation forward into adulthood (Parish & Treasure, 2003; Sallis & McKenzie, 1991). This concept is based on Self-Determination Theory (SDT) which identifies the contributing elements to an individual’s motivation level for participation and the intrinsic inclinations which bring out healthy and effective behaviour (González-Cutre & Sicilia, 2012).

The System for Observing Fitness Instruction Time (SOFIT) is a multi-factor observation system designed to record several variables (physical activity intensity, lesson context and teacher behaviour (McKenzie, Sallis, & Nader, 1991). In addition to the numerous validation studies, there are several variations of the SOFIT, however, to the best of the authors’
knowledge, SOFIT has never been adapted to nor tested in the recreation centre. Given that the structure of PA classes at recreation centres are similar to PE classes in school (an instructor, guidelines for activity, and the activities themselves), it should be established whether or not SOFIT could be used to provide evidence for recreation centre PA programs.

**Method**

Research took place at a recreation centre in the city of Calgary, Alberta. This was the first of a four-phase study. Data presented here from Phase I is being used to determine how much PA is encouraged while simultaneously exploring the context of the lesson and quality of instruction in child and youth PA programs in the recreation sector.

**Participants**

Participants included children (ages 3-14) enrolled in PA programs and the qualified instructors hired by the recreation centre. As no personal information was collected and participants were observed without knowledge of the study protocol, consent was not required. Instructors and participants who asked about the observer were told that they were simply there to watch the class. Very little interaction took place between observers and instructors or participants. This study was approved by the Mount Royal University Human Research Ethics Board.

Five research assistants were trained as observers by the Research Coordinator (RC) who is an expert in the SOFIT methodology. The RC also conducted all of the reliability measurements. Observers had to maintain an 80% or better inter-rater reliability throughout the course of the study.

**Procedures**

Data was collected between January and May, 2013. Observations were taken at the beginning, middle and end of the session to obtain a broad representation of what took place in each program. A wide variety of sports and activities were selected: wall climbing, basketball, badminton, ballet, urban dance, floor hockey, hapkido (martial arts), indoor soccer, multisport, Zumba®, Sportball, gymnastics, and triathlon.

Data collection followed the SOFIT protocol (McKenzie, 1991). Briefly, four students, two girls and two boys, were selected for observation in every class. Each child was observed individually for four minutes at a time. Observations took place in 20s intervals: 10s to observe, 10s to record. This cycle repeated for the entire class. Concurrently, class context and instructor behaviour were observed and recorded.

SOFIT gathers activity data on PA engagement, lesson context and instructor interactions. PA is measured on a five-point hierarchical scale: 1) *lying down*, 2) *sitting*, 3) *standing*, 4) *light PA*, and 5) *moderate-to-vigorous PA* (MVPA; more energy expenditure than an ordinary walk). The activity which took place within the observation period with the highest number was recorded. Lesson context is divided into: *general content* (transition, management and instruction time); *knowledge content* (primary focus is on the acquisition of knowledge related to PA); and *PA motor content* which is divided into *fitness* (such as endurance, strength or flexibility); *skill practice* (primary goal is skill development, such as drills); *game play* (application of skills with little instructor involvement); and *free play* (instruction is not intended and children may choose to participate or not). Teacher interactions receive one of six hierarchical codes: 1) *promotes fitness* (prompting or encouraging PA participation; praise); 2) *demonstrates fitness* (models
fitness engagement); 3) *instructs generally* (lectures, describes, prompts or provides feedback); 4) *manages* (participants or the environment in non-subject matter tasks, such as set-up); 5) *observes* (monitors the group or an individual); and 6) *other task* (attends to events not related to the responsibilities of the class). The activity which took place within the observation period with the lowest number was recorded.

**Results**

Twenty-one programs composed 14 activities/sports were observed. Programs were observed between two and four times each, leading to 69 observation days and 32,996 unique observations. On average, 159 observations were recorded per observation period. Descriptive results are presented only.

Lying down was the least commonly observed PA behaviour in the participants (1.3%), followed by MVPA (13.3%), sitting (18.4%), light PA (25.7%), and standing (41.3%). Participants in individual activities spent more time in MVPA than those in team sports (14.3% vs. 11.6%).

On average, 16.2% of the lesson context was spent in general content. Team sport participants spent more time in general content than those in individual activities (18.8% vs. 11.2%). Twenty percent of time was spent on knowledge content. Team sport participants spent slightly more time on knowledge content than did individual activity participants (21.2% vs. 19.6%). Overall, 36.4% of program time was spent on activities where participants were listening and learning without activity (general content and knowledge content). Motor content is composed of four active components. Participants were observed spending on average 13.6% of their time in fitness; 30.6% on skills; 16.8% in game play; and 2.7% in free time. Only two of the fourteen activities and sports spent more than 2% of class time engaged in free play.

Instructors spent the majority of their time instructing (42.1%) followed by demonstrating (28.1%), managing (11.9%), observing (9.4%), praising (7.7%) and other tasks (0.9%). Individual activity participants received more praise than team sports participants (8.4% vs. 5.4%).

**Discussion**

Offering quality programs with purposeful and measurable outcomes that are developmentally appropriate should be a primary focus of any PA program. Several goals of recreational PA programming exist, including: improving fitness, teaching skills that are useful for a lifetime, and providing a safe space for children to be active. The goal that was the focus of this study was increasing the amount of time that children spend in active play. A quality program will ensure that there is minimal management time and maximal activity time for the children: ultimately, children should be engaged in MVPA 50% of the time (NASPE, 2009) and instructors should be offering encouragement as much as possible (Parish & Treasure, 2003). The only way to know if this is taking place is to objectively evaluate a program. SOFIT has been proven to accurately measure student and teacher behaviours in school-based PE classes. The aim of this study was to determine if SOFIT could be used effectively in a recreation centre.

This study found that more than one-third of program time comprised of non-active participation (general and knowledge content). These results are not vastly different from school-based PE programs evaluated using SOFIT which reported between 32% (McKenzie et al., 1991) and 52% (Keating, Kulinna, & Silverman, 1999) inactive class time. By understanding the context and structure of the programs in this study, it is easier to see why children did not
achieve the recommended 50% MVPA goal. The amount of time that children spend in free play as opposed to fitness and skill development can increase PA levels (McKenzie et al., 1995; Sarkin, McKenzie, & Sallis, 1997; Trost, Rosenkranz, & Dzewaltowski, 2011) yet data from this study show that very little time (<3%) was spent in free play. Improving efficiency through decreased participant management (understanding that it can never be eliminated) and less emphasis on skill development would leave more time for free play. Alternatively, perhaps the goal of spending 50% of program time in MVPA is unrealistic as several studies have reported achieving less than this (Keating, Kulinna, & Silverman, 1999; McKenzie et al., 1995; McKenzie, Sallis, & Nader, 1991; Scroggs et al., 2003; Sharma, Chuang, Skala, & Atteberry, 2011).

Increasing physical activity is also accomplished by improving the class atmosphere. The optimal environment is one in which participants are encouraged to strive for self-improvement; known as a “mastery-based” or a “motivational” climate (Ames, 1992). Classes that operate in a motivational climate have been shown to increase positive PA behaviours (Parish & Treasure, 2003). An important characteristic of a motivational climate is that individual praise – regardless of actual achievement – takes place. Less than 8% of time was spent encouraging participants in this study. If the time spent observing students (9%) was used for simultaneously for praise, this would double the amount of time that instructors spent motivating participants in their endeavours.

Preliminary data from this study demonstrates that recreation centres could benefit from using objective assessment tools to evaluate PA programs in an effort to help improve desired outcomes. An emphasis should be placed on creating environments in which children can be engaged in greater MVPA by increasing free play, reducing management time, and encouraging individual praise.

References


