Toddler Activity Intensity During Indoor Free-Play: Stand and Watch

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ABSTRACT

Objective: Movement patterns among toddlers (16–36 months) differ from other early developmental periods; toddlers practice coordination, balance, and control. Toddler care environments may afford repetition of these emerging skills. This study examined intensity and type of movements during free-play indoors in child care among toddlers.

Methods: A convenience sample (n, 41; mean, 26.5 months) was observed for intensity of physical activity (PA), motor activity type, activity context, and teacher prompts in center-based care using a modified version of the Observational System for Recording Physical Activity for Children–Preschool.

Results: The most frequent PA intensity level was sedentary with limb movement. No significant gender differences emerged. Standing, sitting/squatting, and walking were the most frequent activity types. Dominant activity contexts included fine motor manipulative, self-care, and onlooking. Logistic regression results indicated that onlooking significantly decreased the odds of moderate to vigorous PA. Teachers offered few prompts to increase PA.

Conclusions and Implications: Toddlers demonstrate predominantly sedentary behaviors during free-play. Further observational research across the entire day is warranted to accurately assess intensity and teacher's support for moderate to vigorous PA.

Key Words: toddlers, child care centers, motor activity, play (*J Nutr Educ Behav*. 2015;47:170-175.)

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INTRODUCTION

Empirical evidence reveals rapid increases in weight among American children.[1] Amid children aged 2–5 years, 12% were obese, with a higher prevalence among boys.[1] Empirical evidence suggests that weight status in early childhood may predict weight status in late childhood and possibly adulthood.[2] Approximately 53% of children aged 1–3 years are in nonparental care at least once a week, averaging 29 hours[3]; consequently, it is essential to assess opportunities for physical activity (PA) during child care.

The Institute of Medicine (IOM) identified 4 key factors that influence obesity risk among young children: PA, healthy eating, marketing and screen time, and sleep time.[2] Recognizing that early childhood is a critical period in life to establish positive dietary and PA habits,[2] adults who care for children at home and in child care have a primary role in addressing these factors and children's well-being. Research on preschoolers' PA in child care settings consistently suggests that children aged 3–5 years are predominantly inactive.[4] Brown et al[5] found that 89% of preschool activity was classified as sedentary and 4 activity types characterized much of preschoolers' activity: sit and squat, lie down, stand, and walk.[6] Few empirical studies focused specifically on toddlers (aged 16–36 months), who are developmentally unique from both infants (birth to age 18 months) and preschoolers.[7]

Generalization of PA intensity and types from one age group to another must be done with caution because contextual circumstances change with development.[6] Environments, curriculum, and routines designed and assessed[8] for toddlers are distinct compared with those for preschoolers.[7,9] An environment for toddlers is likely to emphasize relationships, maintenance of the daily routine, fewer transitions during the day, and building self-care skills such as eating and toileting, exploring familiar materials, and dressing themselves. The slower pace of the day allows toddlers time to practice emerging yet immature skills.[7]

Toddlers are gaining strength and practicing new ways to locomote (eg, walk, run, jump), catch, kick, and throw, as well as developing increased hand–eye control to manipulate objects.[10] Although children aged 24–36 months are often included within samples of preschool children, at least 2 studies examined toddlers separately. Van Cauwenberghe and colleagues[11] collected both observational data and objective data on 31 toddlers with accelerometers to measure PA during free-play indoors and outdoors. Analyses of environments

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combined, researchers concluded that toddlers spent most of their time stationary and motionless or stationary with movement of limbs or trunk. However, environment may be a predictive factor of intensity. The observations of Gubbels and colleagues[12] of 2- to 3-year-olds in care revealed that while indoors, 5.5% of activity was classified as moderate to vigorous PA (MVPA) and 59% as sedentary. Outdoors, however, 21% was classified as MVPA and 31% as sedentary. Research findings to date are inconsistent on gender differences in activity intensity.[6,12] Although the outdoor environment may afford more intense activity, the quality of the indoor environment for most learning experiences is of interest[8]; consequently, the focus of this study was toddler PA in the indoor environment.

The Society of Health and Physical Educators[13] offers 3 recommendations uniquely for toddlers (defined as aged 12–36 months). Toddlers should (1) engage in a total of at least 30 minutes (cumulative) of structured PA each day; (2) engage in at least 60 minutes—and up to several hours—per day of unstructured PA and not be sedentary for more than 60 minutes at a time, except when sleeping; and (3) be given ample opportunities to develop movement skills that serve as building blocks for further motor skills. Although it focuses on policy, not curriculum, IOM[2] recommends that toddlers in child care engage in light, moderate, and vigorous PA for at least 15 min/h. In addition, to intentionally increase PA, adults should offer both structured and unstructured developmentally appropriate PA experiences, an indoor environment with a variety of portable play equipment and adequate space, and pedagogy that integrates PA in activities designed to promote cognitive and social development, much of which occurs indoors during free-play.

This study examined PA during morning free-play within toddler-only classrooms designed uniquely for this age group. Research questions were as follows: What is the range of intensity of motor activity; are there gender differences in activity intensity; and what is the range of motor activity types among toddlers during free-play?

METHODS

Participants and Context

Data for this study were drawn from a larger study on language and PA[14] using convenience sampling. Participating toddlers were enrolled in 1 of 2 full-day center-based programs on a university campus in a Midwestern city. One program was nationally accredited and both were state licensed. Four classrooms cared for children aged 12–30 months; 1 cared for children aged 16–30 months; and 2 cared for children aged 6 weeks to 36 months. Parents of toddlers were invited to provide informed consent.

Daily schedules included blocks (50–60 minutes) of child-directed free-play (morning and afternoon) for extended periods of exploration and social engagement. During free-play, children had open access to a wide variety of materials. Each classroom met or exceeded the license requirement of 3.25 m^2/child and had an approximate 3 × 2.5-m area of open space for large group experiences and large block play. Selection of classroom materials and activities was guided by a play-based, developmentally appropriate curriculum.[7] Neither televisions nor computers were available; no teacher used time-out as a disciplinary strategy. Neither facility offered a large indoor activity room. Staff-to-child ratio was 1:5 (group size of 10) or 1:6 (group size of 12).

Measures

The researchers measured toddlers' movement with the Observational System for Recording Physical Activity for Children–Preschool,[5,6] a momentary time sampling observation system, modified for children aged 16–36 months.[6] Researchers pilot-tested the instrument with video observations of 5 toddlers not included in the final sample and determined that additional categories in activity type and activity context would increase the external validity for toddlers.

Children's intensity of motor activity was measured using the activity intensity codes: level 1 = stationary or motionless; level 2 = stationary with limb or trunk movement; level 3 = slow and easy movement; level 4 = moderate movement; and level 5 = fast movements. Motor activity type was measured by 18 specific types of body movements. Nine movement types were added to the original scale reflective of the immature motor skills and care context based on pilot testing: bend (bends at the waistline with straight legs rather than squatting by bending knees), bounce (flexing the knees or torso while feet remain on the floor), carried/held (being carried/held by an adult), creep (movement with arms, hands, legs, and feet to push self with stomach on the floor), fall down (falling, tripping, or stumbling), hanging (removing body weight from the floor such as bending over the edge of a table or holding with hands), hesitation (pause before engaging), kicking (1 leg swings to move an object or air), and scoot (dragging body across surface while lying or sitting). Activity context was measured by noting the presence of 16 different activities. Researchers added 3 based on pilot testing: conversing (engaging in conversation with peer or adult), tantrum (engaging in an emotional outburst; disengaged from play), and onlooking (watching others play; child may talk but does not enter into the play himself).[15] Activity initiator identified the child or the adult as the initiator of the chosen activity (1 = adult; 2 = child). Finally, Prompt for PA identified the speaker and intent directed to the child related to PA: 1 = no prompt; 2 = teacher prompt to increase PA; 3 = teacher prompt to decrease; 4 = peer prompt to increase; and 5 = peer prompt to decrease (Kansas State University IRB #3828).

Procedures and Data Analysis

Each morning during free-play in each classroom (November to March), a participating toddler was randomly selected and videotaped for a 20-minute observation. Subsequent children were selected randomly until all participating children were observed. Children were not recorded while using the toilet. Videotapes were digitized for coding.

Two graduate students (experienced toddler teachers) coded behavior separately following the definitions and protocol described by Brown et al[5,6]