
The Use of Infant Seating Devices in Child Care Centers

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OBJECTIVE. The purpose of this study was to compare the duration of time that infants in child care centers were placed in infant seating devices to the duration of time spent on the floor or being held by child care providers.

METHOD. Thirty-eight infants who were typically developing (mean age = 4.5 months) from eight child care centers were observed minute-by-minute for a consecutive 120 min, targeting the amount of time each infant spent in seating devices, on the floor, or being held by child care providers.

RESULTS. The amount of time the infants spent in seating devices was significantly longer than on the floor ($p = .0001$) or being held by child care providers ($p = .0001$).

CONCLUSION. All infants spent more time in seating devices than on the floor or being held by child care providers. Future research should explore seating device use in infants identified as at-risk or as having special needs, particularly how child care routines for these infants may influence seating device use, as well as the impact of this practice on these infants' motor development.

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The influence of the environment on human occupation, function, and adaptation provides a foundation to the study and provision of occupational therapy (Dunn, Brown, & McGuigan, 1994; Kielhofner & Burke, 1980; Law, Cooper, Strong, Stewart, Rigby, & Letts, 1996). The physical environment consists of “natural and human-made spaces and the objects within them” (Forsyth & Kielhofner, 2003, p. 58). Throughout the life span, aspects of the physical environment interplay with other contexts (e.g., socio-cultural) to shape participation in occupations. The effect of this interaction is particularly salient for infants because of the strong relationship between contextual factors and child development (Abbott & Bartlett, 1999).

Equipment that supports sitting, such as infant seats and swings, is a common component of the physical environment for infants. Different types of seating devices support typical infant occupations (i.e., feeding or eating, playing, sleeping), as well as the occupations of their caregivers (i.e., providing the caregiver with opportunities to complete housework while infant is safe in equipment [Pierce, 2000]). A parent survey of 187 infants younger than 5 months of age found that 42% of infants who were typically developing spent between 4 hr and 8 hr a day in a seating device (Callahan & Sisler, 1997), suggesting that this type of device is a key element of the physical environment for infants in the home.

Recent research has explored the effect of different types of equipment, including seating devices, on infants' motor development. Through a parent survey and developmental evaluation of 43 infants (8 months of age) who were typically developing, Abbott and Bartlett (2001) found a significant negative correlation ($r = -0.50$) between the total amount of time of seating device and other equipment (i.e., walker, playpen) use and the motor development score on the Alberta Infant Motor Scale (AIMS) (Piper & Darrach, 1994). However, causality between the frequency of seating device use and motor developmental scores could not be determined because of the cross-sectional nature of the study. In contrast, another study

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that used a research design similar to Abbott and Bartlett's investigated the use of infant equipment, including seating devices, in the home of 60 preterm infants at 8 months of age and found no significant relationships between average time the infants spent in the equipment and their motor development, as measured using the AIMS (Bartlett & Fanning, 2003). The authors concluded that rather than impair motor development, the use of equipment for infants diagnosed with neurological impairments may serve as a way to improve postural control.

Previous studies have investigated infant seating devices and other infant equipment use within the home. However, approximately 15% of infants younger than 1 year of age receive care within the physical environment of a child care center while their parents are working (Ehrle, Adams, & Tout, 2001). Research of young infants in child care has received little attention in the rehabilitation literature. Mulligan, Specker, Buckley, O'Connor, and Ho (1998) examined the effect of child care center environments, including infant-to-child-care-provider ratio and the use of infant seats, swings, and walkers on the motor development of 48 infants measured longitudinally at 6 months, 9 months, and 12 months of age. At the 6-month and 9-month evaluations, lower psychomotor developmental index (PDI) scores on the Bayley Scales of Infant Development (Bayley, 1969) were found in infants who attended centers with a higher ratio of infant to child care provider. Although a relationship between PDI and device use was not established, the researchers speculated that a higher frequency of device use in centers with a high ratio of infant to child care provider may result in less opportunity for infants to engage in goal-directed movement and thus contribute to lower scores.

Although the early child care and education literature has provided detailed descriptions of appropriate physical environments for young children in child care centers (Curtis & Carter, 2003; Weinberger, 1996), little is known about the type of infant seating devices that are being used in child care centers or the duration of time infants are placed in these devices. Occupational therapists who provide services to infants who are at-risk and infants with disabilities within center-based child care use the physical environment of the setting to design their interventions (Hanft & Pilkington, 2000; Rush, Shelden, & Hanft, 2003). By gaining an increased understanding of the use of infant seating devices (types of devices and frequency of their use) within child care centers, occupational therapists will be better informed to design therapeutic interventions that support infant occupational engagement.

The aim of this exploratory study was to describe the use of infant seating devices in child care centers with

infants who were typically developing. The purpose of the study was to answer the research question: What is the duration of time infants are spending in seating devices as compared to other supported surfaces (i.e., on the floor or being held by child care providers)?

Method

Participants

The study participants were 38 infants who were typically developing, ranging in age from 2 months to 7 months (mean age = 4.5 months), who had not acquired the ability to crawl. Infants were recruited from eight privately operated, licensed child care centers in Gainesville, Florida. The study was approved by the University of Florida Health Science Institutional Review Board.

Procedure

This study is part of a larger study by the authors of this article that surveys infant positioning and use of positioning equipment in child care centers. Observational recording was used to collect data regarding the duration of time infants were placed in seating devices, were on the floor, and were being held by child care providers during a 120-min (2-hr) continuous period. Undergraduate occupational therapy students from the University of Florida served as observers and received a 2.5-hr training session focused on identifying the types of seating devices and positions. Through viewing videotapes, students practiced scoring (i.e., amount of time an infant spent in different supported surfaces) using the data collection form, which included pictures of types of seating devices. The first author contacted the director of each day care center and arranged the time and day for each student to go to the center and collect data. Students went to each of the eight centers during a weekday from Tuesday to Friday. Approximately one half of the students were scheduled to observe at the centers before noon, and the other half went after noon to capture the typical routine of the infant throughout the weekday.

Students were instructed to observe only one infant at each center, and the infant was chosen by the center's director. Infants that were healthy, typically developing, and between 4 weeks of age and 7 months of age were included in the study. The only identifiable information that the student knew about the infant was the date of birth, which was used to calculate the age. Students used the infant's color of clothing ("blue sweater") or hair color ("blonde") to assist them in maintaining correct identification of a particular infant during data collection.

While at the child care center, the students sat quietly and unobtrusively in a corner of the room that provided them good visibility of the infant, and did not interact with the infants or the child care providers at any time during the data collection. Beginning at each 1-min interval during the 120-min observation block (with the aid of a stopwatch), students recorded whether the infant was placed in seating devices, was on the floor, or was being held by a child care provider.

Time spent being held by child care providers is defined as any activity in which the provider was holding or handling the infant, such as rocking the infant while seated in a rocking chair. The potential types of seating devices (see Table 1) included in the data collection form were determined by visiting two child care centers and assembling an inventory of devices used at the centers. The data collection form was pilot tested by the first author before initiating the study.

Of the 61 sets of observation data collected, two infants' data sets were discarded because the parent picked up the infants from the child care center before the 2-hr observation period was over. Twenty-two infants were observed once, 12 infants were observed twice, 3 infants were observed three times, and 1 infant was observed four times. For each infant that was observed more than once, data were averaged across the number of observations. Based on the 59 sets of observation data, the final sample size of the present study was 38 infants.

Data Analysis

The average amount of time infants were in seating devices, on the floor, or being held by child care providers was compiled according to the infants' age categories. Independent sample *t*-tests were used to compare the mean duration of time infants spent in seating devices by two categories of age (i.e., younger than 5 months of age, and 5 months of age or older). The two age categories were chosen because most

infants learn to sit unsupported or with little support by 5 months of age (Alexander, Boehme, & Cupps, 1993); therefore, it was anticipated that older infants would spend less time in seating devices. Paired *t*-tests were used to compare the mean amount of time the same infants spent in the seating devices to that on the floor or being held by child care providers.

Results

Results indicate that infants spent the majority of the observed time, an average of 62.3 min (51.9%) of the 120-min observation session, in seating devices, with the youngest infants spending the most time sitting in devices (see Table 2). Comparisons of the mean duration of time in seating devices of the younger infants (younger than 5 months of age) versus the older infants (at least 5 months of age) indicated that those younger than 5 months of age spent significantly more time in seating devices than the older infants [$t(36) = 3.28, p = .0023, d = .23$]. Infants spent an average of 19.5 min (16.2%) of the observation time on the floor, and an average of 22.9 min (19.0%) of the observation time being held by a child care provider. Infants spent significantly more time in seating devices than on the floor [$t(37) = 5.27, p = .0001, d = .429$] or being held by a child care provider [$t(37) = 5.53, p = .0001, d = .453$].

For the infants younger than 5 months of age, the order of frequency of the seating devices in which the infants were placed the most to the least often was: bouncy seats, swings, car seats, stationary activity centers, and baby rockers. For infants 5 months of age or older, the order was: stationary activity centers, swings, bouncy seats, car seats, and baby rockers.

Discussion

The study results suggested that infant seating devices were a common feature of the physical environment of the child care centers that participated in the study and that infants spent a large portion of the observation time in them, indicating that the use of infant seating devices was an important part of the daily routines of the child care providers. Older infants spent less time in seating devices than younger infants, most likely because of maturational changes; but all infants spent significantly more time in seating devices than on the floor or being held by child care providers. The types of seating devices used most often for each age group is reflective of developmental changes: younger infants tended to spend more time in seating devices that provided more support (i.e., bouncy seats), whereas older infants spent more time in stationary activity

Table 1. Descriptions of Seating Devices

Seating Device	Description
Baby rocker	A semi-reclined seat that sits on curved supports that allow it to rock
Bouncy seat	A semi-reclined seat that bounces either manually or mechanically; it may have a vibration option
Car or baby seat	A seat that does not move; it can be semi-reclined or upright
Stationary activity center	A round shelf with toys that is attached to a secure base and has a sling seat in the center; it allows infants to push up with their feet to a standing position
Swing	A seat that hangs from a frame and moves forward and backward mechanically

Table 2. Time That Infants Spent in Various Supported Surfaces Within the 120-Min Observation Period

Age Group	<i>n</i>	Amount of Time in Seating Devices (in Minutes)			Amount of Time on Floor (in Minutes)			Amount of Time Being Held by Child Care Providers (in Minutes)		
		Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
2–3 months	7	87.5	26.1	38.5 – 113.0	4.7	8.1	0.0 – 22.0	19.9	16.9	6.0 – 54.0
>3–4 months	7	74.4	36.0	33.0 – 112.0	7.3	9.2	0.0 – 20.5	24.6	22.0	8.0 – 67.5
>4–5 months	7	47.7	34.9	8.0 – 93.0	15.9	21.2	0.0 – 56.0	33.9	25.2	9.0 – 72.5
>5–6 months	9	61.7	24.7	10.0 – 102.0	27.7	25.6	0.0 – 89.0	18.7	8.4	7.0 – 37.5
>6 months	8	42.9	31.7	0.0 – 105.0	37.1	21.0	2.0 – 73.0	19.0	12.8	2.0 – 37.0
All Infants	38	62.3	33.3	0.0 – 113.0	19.5	21.8	0.0 – 89.0	22.9	17.5	2.0 – 72.5

centers, which require less trunk support and encourage opportunities for supported standing.

The provision of early intervention services in natural environments, which includes child care centers, is a requirement of the Individuals with Disabilities Education Act (IDEA, Pub. L. 105-17). To support the provision of services within natural environments, occupational therapists have been encouraged to incorporate therapeutic interventions into the activities of caregivers or child care providers through “coaching” them on how to continue the intervention within daily routines (Campbell, 1997; Hanft & Pilkington, 2000; Rush et al., 2003). Coaching and consultation by occupational therapists in child care centers may be supported by incorporating seating devices into interventions or by assisting child care providers to adapt routines to offer other positioning options to facilitate motor development of young infants.

In this study, only infants who were typically developing were included. It is unknown whether infants with special needs would be placed in seating devices for a similar amount of time. The results of research on equipment use in the home and child care centers have not demonstrated any significant motor development delays in infants (Abbott & Barlett, 2001; Bartlett & Fanning, 2003; Mulligan et al., 1998), but as more infants identified as at-risk or having special needs are included in center-based child care, further research in this area is warranted.

This exploratory study had several limitations. Because of the scheduling restriction of the student observers, the observation time may not be representative of the entire time that the infants resided in the center, although there is no reason to assume that the day that the observation was made was atypical. In fact, all student observers confirmed from the child care providers at the child care centers that this was the typical day for the infants. Although the observation times were split between morning and afternoon, using a longer observation time or a momentary time sampling observation strategy throughout the day would provide a better representation of the positioning practice of the child care provider for the infants. These modifications would assist in determining whether these types of posi-

tioning practices represent the infants’ entire daily routine rather than just the routine in a 2-hr time period.

The scope of this study is restricted by its small sample of infants who were typically developing and from eight child care centers in an urban area, and description of seating device use only. This study could be replicated with a variety of child care centers (i.e., state-funded or county-funded, university-affiliated, faith-based, franchise, etc.) to determine whether similar practices occur across them. The large amount of variability of the infants’ duration of time spent in seating devices, on the floor, or being held by child care providers suggests that there could be much variability between child care providers and the centers in which they work. Studies using a qualitative methodology, particularly those that videotape the actions of their participants, have the potential to capture this variability while providing important insights into the relationship between seating devices and the routines of child care providers and infants. Finally, future studies should investigate the use of seating devices in child care centers with infants identified as at-risk or with special needs, including descriptions of infant and child care provider occupations.

Conclusion

The seating device use in eight child care centers of 38 infants who were typically developing was reported. All infants spent more time in seating devices than on the floor or being held by child care providers, with infants younger than 5 months of age spending the greatest amount of time in seating devices. The results of this study provide a pilot investigation into the role of the physical environment and child care providers’ practices, and a foundation for future research to explore how seating device use may be influenced by child care routines for infants identified as at-risk or as having special needs. ▲

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