Parent/Caregiver Supervision and Child Injury

A Systematic Review of Critical Dimensions for Understanding This Relationship

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This study reviewed the relationship between recognized dimensions of supervision and children's injuries based on Saluja et al's (*Injury Control and Safety Promotion*. 2004;11:17–22) hierarchical model of supervision strategies. A systematic review of peer-review studies was done with the earliest records available to 2007. There were 112 potentially relevant articles identified; 31 studies met all inclusion criteria. Reported studies were categorized according to the dimensions of supervision they addressed. Studies were not evenly distributed across the dimensions. There was evidence from the study that directly linking dimensions of supervision to child injury risk and outcomes is scarce. Future studies should consider attention, proximity, and continuity of supervision to provide a holistic understanding of the relationship between supervision and injury.

Key words: supervision, unintentional injury, young children

UNINTENTIONAL INJURY is a leading cause of death and hospitalization during childhood in developed countries.^{1–4} The frequency, severity, potential for disability and death, and cost of unintentional injury make it a leading childhood health problem and children aged 0–14 years are a priority target group for injury prevention in many jurisdictions.^{5,6} More than any other

age group in childhood, infants and toddlers (aged 0–4 years) rely directly on others for their safety.⁵ Preventing unintentional injuries among this group depends on creating safer environments and products, as well as influencing and educating those in the community who supervise and care for them. Appropriate supervision provides an environment that allows safe and successful accomplishment of tasks, preventing them from attempting inappropriate activities.⁷

Supervision is the most common injury prevention strategy adopted by caregivers⁸ and has been regarded as one of the most important determinants of children's safety and unintentional injury risk in several contexts.^{9–14} Lack of, or inadequate, supervision is frequently cited as a primary contributing factor to unintentional injury, although only a small number of studies directly relating

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parental supervision to injury risk have been reported.^{10,15-17} With normal development, there is a reduced need to supervise children as they age.^{13,14} However, limited evidence exists about appropriate levels of supervision as children grow and develop.¹³ Increased understanding of the relationship between supervision and child injury risk across different contexts will contribute to advances in injury prevention and lead to further declines in child injury-related death and hospitalization rates.

Saluja et al¹⁸ developed a hierarchical model of supervision strategies relevant to injury prevention behaviors, incorporating 3 dimensions. *Attention*, defined as interaction and engagement with the child, is measured according to 2 components (visual: focal, peripheral; auditory: focal, peripheral). *Proximity* refers to the distance between the supervisor and the child and is measured from the closest proximity to the least: touching; within reach; beyond reach nearby; and beyond reach distant. *Continuity* is the state of being uninterrupted, defined as continuous, intermittent, or absent. According to this model, a combination of all 3 dimensions is required to measure supervisory behaviors, with the level of supervision escalating as 1 or more supervision dimensions increase.¹⁸ This article presents a systematic review of the relationship between injury risk and degree of supervision based on this model. The methods adopted in these studies are reviewed elsewhere.¹⁹

METHODS

Inclusion and exclusion criteria

Studies were included on the basis of meeting the following 4 criteria: (1) explained different aspects of supervision and/or evaluated supervision based on an outcome measure (irrespective of how supervision was defined); (2) reported on any form of supervision provided by parents/caregivers, guardians, or siblings to prevent unintentional injury to children; (3) targeted supervised children aged 0–14 years; and (4) included a primary out-

come measure of injury risk, injury incidence, or both.

Supervisory neglect studies were excluded as there is no clear definition of when inadequate supervision becomes neglect.¹⁸ Studies of child poisonings and burns were also excluded because such injuries are frequently linked to nonsupervisory strategies such as the removal, controlled use, and redesign of products.^{20,21} In addition, studies in which parents or guardians were not responsible for the supervision of their child (such as formal child care, creche, or school settings) were excluded.

Identification of studies

Relevant electronic databases were searched for published and in-press studies from the earliest available records (range 1800 [The Cochrane Library] to 1989 [AUSPORT and AUSPORTMed]) until December 2007 (Academic Search Premier, AUSPORT, AUSPORTMed, CINAHL, Cochrane Database of Systematic Reviews, ERIC, Health Source Consumer, Health Source Nursing, PsycINFO, PubMed, SafetyLit, Scopus, SPORTDiscus, Springer Link, and Web of Science). Although databases were searched for all languages, only English search terms were employed. Hand searching of the reference lists of published and in press studies, bibliographies of systematic and nonsystematic reviews, and searching of relevant journals was also undertaken. Search term selection followed recommended guidelines.²² The following search terms were used: “injury prevention” or “injury risk” or “unintentional injury” in juxtaposition with “carer,” “guardian or parent,” and “supervision.” “Supervision” was subsequently combined with “child,” “infant,” “toddler” or “young children.” “Carer,” “parent,” “guardian,” and “supervision” were searched, and then used in conjunction with “accident,” “near accident,” and “near miss.” These terms were combined independently with “aquatic,” “beach,” “lake,” “pool,” “river,” “water,” “drowning” and “near drowning,” “playground,” “play environment,” and “pedestrian.”

Table 1. Strength of evidence grading scale for measurement of child supervision

Strength of Evidence	Number of Supervision Dimensions Considered	Number of Studies	References
Least ↓	One supervision dimension		
	Attention	4	Morrongiello et al, ¹² Morrongiello et al, ²⁴ Smith et al, ²⁵ Harrell & Reid. ³⁶
	Proximity	3	Wills et al, ¹⁴ Pollack-Nelson & Drago, ²⁶ Wills et al. ³⁴
	Continuity	10	Peterson et al, ¹³ Morrongiello & Hogg, ²⁷ Ross et al, ⁴⁰ Blum & Shield, ⁴¹ Rauchschalbe et al, ⁴² Simon et al, ⁴³ Cass et al, ⁴⁴ Kemp et al, ⁴⁵ Jensen et al, ⁴⁶ Somers et al, ⁴⁷
	Two supervision dimensions		
	Attention and proximity	9	Iltus, ⁸ Garling & Garling, ⁹ Morrongiello & Dawber, ²⁸ Cataldo et al., ²⁹ Garling & Garling, ³⁰ Morrongiello & House, ³² Harrell, ³⁵ Harrell, ³⁷ Harrell. ³⁸
	Attention and continuity	1	Landen et al. ¹¹
Most	Three supervision dimensions: Attention, proximity, and continuity	4	Morrongiello et al, ¹⁶ Morrongiello et al, ¹⁷ Bugeja & Franklin, ²³ Morrongiello et al. ³¹

Titles, abstracts, and key words of identified studies were examined to categorize articles of potential relevance. Full text of eligible studies was obtained and assessed against the inclusion criteria, and obvious exclusions were removed.

Quality assessment

A quality rating scale assessing the measurement of supervision was developed on the basis of the work of Saluja et al,¹⁸ whose model provides a template explicitly for the relationship between injury risk and supervision.²³ An assessment of the classification of supervision and its impact on study strength were based on this holistic measurement of supervision (Table 1).

RESULTS

One hundred twelve potentially relevant studies were retrieved. After reading the full texts of these studies, only 31 met all inclusion criteria. Studies were eliminated prin-

cipally because no level of supervision was discussed, or the effectiveness of supervision was not evaluated through an outcome measure. The dimensions of supervision covered by included studies were not evenly distributed across the Saluja et al¹⁸ model, with some studies measuring a combination of dimensions (Table 1). It is of note that the more recent studies, from 2004, have covered all 3 dimensions.

The assessment of parental supervision and its role in the prevention of unintentional injuries has been explored across various contexts, the most common being the home or aquatic settings. Playgrounds, supermarket, and pedestrian settings have also been examined (Table 2).

Comparison of supervision in different environments

Aquatic environments

Absent or inadequate supervision has been identified frequently in studies of drowning

Table 2. Environmental settings, and categorization of identified studies according to the Saluja et al¹⁸ model of supervision

Setting	Number of Studies	Supervision Dimensions	References
Playground	1	Attention and proximity	Morrongiello & House. ³²
Pedestrian injury	2	Proximity only	Wills et al, ¹⁴ Wills et al. ³⁴
Multiple contexts ^a	2	Attention and continuity	Landen et al. ¹¹
		Continuity only	Peterson et al. ¹³
Supermarket	4	Attention only	Harrell & Reid. ³⁶
		Attention and proximity	Harrell, ³⁵ Harrell, ³⁷ Harrell. ³⁸
Aquatic	9	Continuity only	Ross et al, ⁴⁰ Blum & Shield, ⁴¹ Rauchschwalbe et al, ⁴² Simon et al, ⁴³ Cass et al, ⁴⁴ Kemp et al, ⁴⁵ Jensen et al, ⁴⁶ Somers et al. ⁴⁷
		Attention, proximity, and continuity	Bugeja & Franklin. ²³
Home	13	Attention only	Morrongiello et al, ¹² Morrongiello et al, ²⁴ Smith et al ²⁵
		Proximity only	Pollack-Nelson & Drago. ²⁶
		Continuity only	Morrongiello & Hogg, ²⁷
		Attention and proximity	Iltus, ⁸ Garling & Garling, ⁹ Morrongiello & Dawber, ²⁸ Cataldo et al, ²⁹ Garling & Garling ³⁰
		Attention, proximity, and continuity	Morrongiello et al, ¹⁶ Morrongiello et al, ¹⁷ Morrongiello et al ³¹

^aMore than 1 environmental setting considered in a single study.

and near drowning (Table 3). However, the statistical effect of the role supervision plays in decreasing drowning and injury in an aquatic context is limited. Most aquatic studies are limited in that they only examined continuity of supervision. The most recent work identified in this area²³ implemented Saluja et al's model¹⁸ through a deconstruction of coroners' reports. It found the most common supervision pattern associated with drowning deaths was "carer's attention considered auditory peripheral, proximity was beyond reach and continuity was absent."^{23(p303)}

Home environments

Many studies have explored injury risk and supervision in the home setting^{8,9,12,16,17,24-31}

(Table 4). Despite a number of studies asking parents to comment on the child safety practices they employed, one third of them investigated only 1 supervision dimension. Although both attention and proximity have been considered frequently in the home context, only studies considering all 3 dimensions provide specific evidence linking supervision to unintentional injury risk.^{16,17,31}

Structured playground environments

Only 1 relevant study was identified in the playground setting.³² This self-report study found low, but significant, associations between attention and proximity.

Table 3. Key features of studies of supervision in the aquatic environments

Author (Date)	Study Type	Period of Study	Sample Size and Injury Target Group	Supervision Dimensions	Key Results
Blum & Shield (2000) ⁴¹	Case series review	January 1, 1992–December 31, 1997	33 drownings, children aged 1–4 years	Continuity	Twenty-eight children were in the care of 1 or both parents at time of drowning. Supervision temporarily interrupted ($n = 15$), confusion about who was supervising ($n = 3$); supervisor watching television ($n = 3$); and supervision interrupted in various ways (11)
Bugeja & Franklin (2005) ²³	Case series review	January 1, 1989–December 31, 2001	27 drownings, children aged ≤ 5 years	Attention, proximity, and continuity	Boys accounted for 74% of deaths. Five major factors common among incidents, absent supervision; stage of child development; child playing outside house; dam within 300 m of where child playing; and lack of effective barriers between dam and the child
Cass et al (1996) ⁴⁴	Case series review	1990–1995	132 drownings, children 0–14 years	Continuity	Most deaths were infants 0–4 y ($n = 96$). Boys more likely to drown than girls, overall incidence in boys (average 2.2 per 100 000) consistently and significantly higher ($t = 4.15$, $df = 10$, $P < 0.01$) than girls (average 1.09 per 100 000). Lack of supervision a major factor
Jensen et al (1992) ⁴⁶	Case series review	January 1, 1984–December 31, 1988	119 submersion incidents children aged <5 years	Continuity	Of submersions identified 29 (24%) resulted in death. Supervision was absent in all but 1 bathtub related drownings and for the majority (61%) of injuries
Kemp et al (1994) ⁴⁵	Case series review	1988–1989	44 submersions, children aged <15 years	Continuity	Drowning in pools and moving bodies of water resulted from unintentional falls into water
Rauchschwalbe et al (1997) ⁴²	Case series review	1983–1994	32 drownings, children aged ≤ 15 months	Continuity	Ten cases had atypical submersions and features consistent with child abuse or homicide. Twenty-eight cases of accidental submersion, 8 of which involved absence of supervision
Ross et al (2003) ⁴⁰	Case series review	January 1994–December 1996	169 near drownings, children ≤ 5 years	Continuity	Reported lapse in adult supervision in 29 (91%) of incidents, with reported duration ranging from 1 to 35 minutes, mean and median lapse of 6 and 4 minutes, respectively
Simon et al (2003) ⁴³	Self report	September–November 2001	259 parents with children ≤ 5 years	Continuity	The majority of near drownings occurred in or near home (139, 82%), usually swimming pool or bath. Of the 26 children who nearly drowned in bath, 9 were left unattended; and of 38 swimming pool near drownings, 19 accessed unfenced pools unsupervised
Somers et al (2006) ⁴⁷	Case series review	1984–2003	81 drowning cases in children <7 years	Continuity	Investigation of supervision behaviors rather than drowning deaths. 31% of respondents reported leaving child unsupervised in bathtub. Mean age of children left alone was 37.5 months, with the youngest being 5 months
					Lack of adequate supervision a factor in 89% of bathtub drownings ($n = 18$). Mean age of children was 17 months, and in 16 of the drowning incidents children were left unsupervised for up to 20 minutes

Table 4. Key features of studies of supervision and child injury risk in the home

Author (Date)	Study type	Period of Study	Sample Size and Injury Target Group	Supervision Dimensions	Key Results
Cataldo et al (1992) ²⁹	Observation	Duration or year not specified	Parents of 10 children aged 2–3.5 y who received medical attention; 9 parents and children who had not	Attention proximity	Injured group had significantly higher percentages of hazard contacts, activity changes, and disruptive behaviors and lower percentages of appropriate behaviors than matched pairs
Garling & Garling (1993) ⁹ , Garling & Garling (1995) ³⁰	Self report	March–May 1988 and 1989	Two random samples of 96 and 54 mothers of children aged 1–3 y	Attention proximity	Mothers perceived a reduced risk of injury when conditions allow greater supervision $F_{3,387} = 181.08, P < 0.001$. Supervision did not reduce perceived risk as much for older children as younger children $F_{6,378} = 4.10, P < 0.001$, or in less dangerous rooms compared with more dangerous rooms $F_{9,1134} = 7.02, P < 0.001$
Ittus (1994) ⁸	Self report	Data collected over 1 y	Thirty-six families with a target child aged 1, 2, or 3 y	Attention proximity	Supervision, the most common injury prevention strategy adopted by parents, but effectiveness of supervision varied from family to family. Age and gender were major predictors of whether child would be left alone and unsupervised
Morrongiello et al (2007) ²⁴	Self report	Duration or year not specified	205 mothers	Attention	Sibling supervision in family room significantly exceeded all other locations ($P < 0.05$). Increased dependence on sibling supervision linked to more frequent child injuries requiring parent attention ($M = 2.40, SD = 2.18, r = 0.26, P < 0.01$) and moderate injuries ($M = 13.17, SD = 9.44, r = 0.35, P < 0.01$)
Morrongiello et al (2006) ³¹	Self-report	Duration or year not specified	40 mothers of children ~2.5 y; 28 mothers of children ~5 y	Attention proximity continuity	Proportion of time child left unsupervised varied significantly with child age $F_{1,64} = 26.98, P < 0.001$, younger children unsupervised less than older children. Children unsupervised in living/family room more frequently than in either bathroom/kitchen/dinning ($P < 0.05$) or the playroom ($P < 0.01$)

(continues)

Table 4. Key features of studies of supervision and child injury risk in the home (Continued)

Author (Date)	Study Type	Period of Study	Sample Size and Injury Target Group	Supervision Dimensions	Key Results
Morrongiello & Dawber (1998) ²⁸	Observation	Duration or year not specified	30 mother-child pairs, with children aged 2.5-3.5 y	Attention proximity	No significant observed difference between child injury history and children approaching hazards. Caregivers used more verbal redirection strategies for girls than for boys ($M = 1.0$ and 2.7 , $SD = 0$ and 0.47 , respectively; $F_{1,23} = 31.8$, $P < 0.05$), and physical redirection strategies for boys and girls ($F_{4,400} = 3.82$, $P < 0.01$, indicated type of supervision at the time of injury differed for girls and boys. With intermittent supervision, injury rates for boys and girls differed significantly ($P < 0.05$), boys experiencing more injuries. Constant supervision only supervision strategy to reduce injury for boys Children who complied with home safety rules experienced fewer injuries ($P < 0.01$). Parental supervision scores negatively related to child injury scores ($r[97] = -0.35$, $P < 0.01$)
Morrongiello, et al (2004) ¹⁶ , Morrongiello, et al (2004) ¹⁷	Self report	Duration or year not specified	62 mothers with a first born child aged 2-2.5 y	Attention proximity continuity	75% of 2-year-olds directly supervised, compared with 50% of 3-year-olds, and 58% of 4-year-olds. 98% of respondents indicated times when supervision absent, caregivers checked younger children more frequently than older children Supervision provided by an adult in 69.2% of cases, and by a person younger than 18 in additional 8.7% of cases
Morrongiello et al (2001) ¹²	Self-report	Duration or year not specified	97 parent child pairs, with child aged 4-6 y	Attention	
Pollack-Nelson & Drago (2002) ²⁶	Self-report	September-November 1999	59 respondents provided information on 83 children aged 2-6 y	Proximity	
Smith et al (1997) ²⁵	Observation	March 1993-February 1996	271 children aged 4-20 mo	Attention	

Pedestrian injuries

Little is known about parental understanding of children's behavior in traffic and the methods they use to supervise them.³³ Two studies based on the same data described supervision based on attention and proximity.^{14,34} They illustrated that an absence of supervision increased the risk of pedestrian injury, with 64% ($n = 91$) of pedestrian injury victims unsupervised when injured. Among supervised children who were injured, 51 supervisors (59%) were within arms reach and reported that the child suddenly darted into traffic (35%), while in 31% of cases the supervisor was distracted.

Supermarkets

Four observational studies have investigated parental supervision during supermarket shopping visits.³⁵⁻³⁸ The earliest work examined only 1 dimension, attention,³⁶ whereas more recent studies have investigated proximity and attention.^{35,37,38} Table 5 summarizes the key features of these studies.

DISCUSSION

This review describes studies that explicitly measured supervision in relation to child unintentional injury. Roberts³⁹ suggested that the etiological role of caregiver supervision is usually intuitively rather than empirically identified, and our initial literature search supports this. Diverse definitions of supervision have been used in the published literature, making it challenging to draw direct comparisons. To facilitate investigation, we have classified each study according to where it best fits in the Saluja et al¹⁸ conceptual model of supervision dimensions.

Attention as a sole measure

Studies measuring attentional supervision found, as expected, that caregiver supervision was associated with injury frequency.^{12,24,36} Children experienced fewer injuries when caregivers provided attentional supervision. However, the quality of this evidence is lim-

ited in studies that considered supervision only from the point of view of attention. Smith et al²⁵ investigated attentional supervision related to baby walker injury in the home.²⁵ Attentional supervision, defined as observing the child in the same room at the time of the injury incident, was provided in 78% of cases. It was concluded that supervision does not adequately prevent baby walker-related injuries, demonstrating the limitations of measuring a single dimension, as while attentional supervision alone may not be protective, the value of supervision encompassing all dimensions cannot be established.

Proximity as a sole measure

Three studies measured proximity of supervision. The wording used to describe this dimension, and the scale on which proximity is measured, differs across studies.^{14,26,34} Difficulties arise when attempting to develop a standardized quantitative measure of proximity dimension of Saluja et al,¹⁸ as the requirement for appropriate proximity varies dependent on the recreational activity or play context, and child age and developmental level. Proximity of supervision in 2 studies^{14,34} of 142 child (aged 5-12 years) pedestrian injuries was coded as none (no supervisor present); near (touching or within arms length); and far (more than arm's length). Although this categorization was appropriate for pedestrian injury, it may be inappropriate in other recreational play contexts. Morrongiello and House³² found that, of Saluja et al dimensions, only proximity decreased child risk taking in playground settings. This suggests that proximity may be of greatest importance in supervision as a protective factor for child injury, at least in this setting.

Continuity as a sole measure of supervision

Although continuity is a recognized dimension of supervision, it is not always considered. Critical review of attention and proximity studies provides some indication of the

Table 5. Key features of studies of supervision and child injury risk in supermarket settings

Author (Date)	Study Type	Period of Study	Sample Size and Injury Target Group	Supervision Dimensions	Key Results
Harrell (2003) ³⁷	Observation study-intervention	Duration or year not specified	231 children aged 1-5 y and accompanying adult	Attention proximity	Increased risky and dangerous behaviors with decreased supervision. Tendency of child to stand on edge of cart linked to decreased visual supervision ($P < 0.01$). Climbing out of cart predicted by the number of times caregiver decreased proximity ($P < 0.05$) and child location in cart ($P < 0.05$)
Harrell (2003) ³⁸	Observation	Duration or year not specified	390 children aged 1-6 years and accompanying adult	Attention proximity	5% of adults lost sight of children at least once ($n = 18$) and 25% ($n = 95$) were 10 ft or more away. Female supervisors significantly ($P < 0.05$) more likely than males to be nonproximate. Dangerous activities by children related to level of supervision, location in cart and age of the child
Harrell (1994) ³⁵	Observation	Duration or year not specified	235 children aged 1-5 y and accompanying adult	Attention proximity	Increased risk of injury when supervisors less proximate (0.032 vs 0.029). For children in cart, greater risk of injury when supervisors lose visual contact at least once (0.017) to those constantly supervised (0.000) ($t = 2.60$, $df = 65$, $P < 0.02$)
Harrell & Reid (1990) ³⁶	Observation	November 1986, 7 days a week from 9:00 AM to 5:00 PM	236 children aged 1-5 years and accompanying adult	Attention	More than 80% of adults left children unattended on at least 1 occasion. Child age only variable significantly related to adult monitoring, 28% of children <3 years were never out of visual contact, vs 9.7% of older children

role of continuity of supervision. However, when continuity is not explicitly measured, only subjective judgment can occur. As a sole measure, continuity provides only an index of the constancy of caregiver supervision. A lapse or an absence of caregiver supervision was reported as a common contributing factor for drowning and injury incidents in 10 studies.^{13,27,40-47} Few studies that measured continuity also defined supervision; however, reasons for the caregiver being absent were frequently documented^{40-42,45,46} and provided an understanding of some caregiver distracters. One study provided depth to the categorization of continuity, suggesting time frames over which a lack of supervision could be considered intermittent or absent.¹³ The development of standardized time frames to further describe each of the levels of continuity would enhance the accuracy of its categorization. This is particularly pertinent in studies relating to the aquatic environment, where to date, the majority of studies use continuity as the sole measure of supervision.⁴⁰⁻⁴⁷ A quantitative measure of continuity, in conjunction with measurement of attention and proximity, will enhance the understanding of supervisory practices, or lack thereof, which have been suggested to have contributed to drowning incidents.

Attention and proximity

Attention and proximity have been jointly measured in a number of studies^{8,9,28-30,32,35,37,38} in different settings. In supermarkets, child risky and dangerous behaviors were associated with decreased attentional supervision and caregivers being less proximate.^{35,37,38} Similar associations were identified in the home, with reduced risk of injury associated with greater supervision.^{8,9,30} Studies of both attention and proximity provide evidence that supervision decreases child injury, and that child age, gender, and area of child play are major predictors of levels of supervision.^{8,9,30,36,38} However, little is known about the broader issue of how appropriate supervision is protective.^{16,17}

Attention and continuity

Attention and continuity of supervision were described in a study of the role of supervision in injury deaths among children aged 0-6 years in Alaska and Louisiana.¹¹ Inadequate parental supervision contributed to 43% of childhood deaths. This ranged from supervision being present but inadequate (45% of cases), absent (37%), and dangerous (17%). The large proportion of deaths attributed to inadequate supervision provides support for prevention programs that focus on increasing parental appreciation of the relationship between supervision and child injury risk.

Attention, proximity, and continuity

The most recent supervision studies in the home setting^{16,17,31} provide the highest-quality evidence of a direct link between dimensions of supervision and child unintentional injury. Two studies^{16,17} clearly linked to the 3 supervision dimensions, even though they used different terms. When children were unsupervised or caregivers intermittently listened, comparably high injury rates were reported. Low injury rates were recorded when children were provided with constant and direct supervision. A similar trend was found in a later study, with "out of view" supervision found to be less effective than providing supervision while within view of the child, elevating injury risk especially for boys.³¹

Understanding the importance of supervision to decrease child injury in the home is a starting point. Further research needs to be conducted in other common child play settings. Only 1 study assessed the 3 dimensions of supervision within an aquatic environment and concluded that absence of supervision is the most common contributing factor in child drowning incidents.²³ The 3 dimensions of supervision should coexist,³² and although the effectiveness of attention and continuity may be reduced with low proximity, there is a need for further empirical research to determine whether 1 supervision dimension is

more important, or should be more heavily weighted, than others.

Implications for implementing the Saluja et al¹⁸ model in injury prevention practice

This review highlights the importance of expanding measures of supervision to encompass all 3 dimensions of the Saluja et al¹⁸ model. To date, the model's 3 dimensions appear to provide a sound framework for measuring supervision. However, there is a need for further empirical research to explore whether additional dimensions of supervision have been overlooked, or whether a combination of different models is better able to capture the complexity of supervision. To effectively implement the Saluja et al¹⁸ model, factors including, but not limited to, the role of supervision and the developmental stage of the child; the child age; and the risk level within the environment must also be considered. The measurement within the 3 dimensions should be adjusted to reflect appropriate and practical supervision for the child developmental age, activity, and injury risk setting. For example, Saluja et al¹⁸ claimed that touch and continuous attention is required

for a 5-month-old in a bathtub although intermittent attention from a distant location may be adequate for a child playing in his or her bedroom.

SUMMARY/CONCLUSION

Based on the studies of supervision reviewed here, it is clear that the 3 dimensions of supervision—attention, proximity, and continuity—have been adopted to varying extents, and in differing combinations across studies. These 3 dimensions are all important components in investigating supervision, and it is becoming evident that caregivers providing direct attention, with closest proximity on a continual basis, best ensures child safety.¹⁷ To better understand the role of supervision as a risk or protective factor for child injury, future research should assess all supervisory dimensions. Such a holistic understanding of the relationship between supervision and child injury will most effectively inform prevention strategies and caregiver education programs. Furthermore, key stakeholders in injury prevention need to highlight this phenomenon so that future studies contribute valuable information to the area.

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