Journal of Pediatric Nursing (2010) **25**, 35–45

Differential Effects of a Nurse Home-Visiting Intervention on Physically Aggressive Behavior in Children

Kimberly Sidora-Arcoleo PhD, MPH [a,*], Elizabeth Anson MS [b], Michael Lorber PhD [c], Robert Cole PhD, MS [b], David Olds PhD [d], Harriet Kitzman PhD, RN [e]

[a] *Arizona State University College of Nursing and Healthcare Innovation, Phoenix, AZ*
[b] *University of Rochester School of Nursing, Rochester, NY*
[c] *Scripps College, Department of Psychology, Claremont, CA*
[d] *University of Colorado, Department of Pediatrics, Denver, CO*
[e] *University of Rochester School of Nursing and Department of Pediatrics, Rochester, NY*

Key words:
Nurse home visiting;
Physical aggression;
Children

Objective: The objective of this study is to examine the differential effects of nurse home visiting (NV) on physical aggression (PA) among children aged 2–12 years.
Methods: This study used secondary data analysis from a randomized trial of NV intervention.
Results: There were significant reductions in PA observed among NV girls at 2 years old and NV children of high-psychological-resource mothers at 6 and 12 years old. Mediation analyses suggest that reductions in PA yield increased verbal ability among girls.
Conclusions: Differential effects of intervention on PA by gender and mother's psychological resources highlight the importance of subgroup analyses. Identification of groups most likely to benefit may lead to more successful interventions.

PARENT TRAINING HAS become a major focus of intervention efforts aimed at preventing or reducing conduct problems (including physically aggressive behavior) and preventing violence among children through the reduction of maladaptive parenting behaviors and an increase in the use of positive parenting strategies (Bor, Sanders, & Markie-Dadds, 2002; Brestan & Eyberg, 1998; Gross et al., 2003; Spoth, Redmond, & Shin, 1998; Reid, Webster-Stratton, & Baybar, 2004; Sanders, 1999; Sanders, Markie-Dadds, Tully, & Bor, 2000; Sanders, Turner, & Markie-Dadds, 2002; Spoth, Redmond, & Shin, 1998; Taylor & Biglan, 1998; Webster-Stratton & Reid, 2003a; Webster-Stratton & Reid, 2003b; Webster-Stratton, Reid, & Hammond, 2001; Webster-Stratton & Taylor, 2001). Parenting interventions that include language promotion activities and parenting skills training may yield the most effective strategies for the prevention or reduction of physical aggression (Arnold, Lonigan, Whitehurst, & Epstein, 1994) through direct effects on physical aggression and indirect effects on physical aggression that are mediated by improved verbal abilities.

Deciding when to implement intervention programs so that they are successful is a challenging task but crucial if we are to prevent individuals from developing into life-course persistent offenders (Moffitt, 1993; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996). Evidence is accumulating that persistent physical aggression leading to adolescent and adult violence develops prior to a child entering school and that the best time to intervene is prior to the age of 8 years, before these behaviors become ingrained (Brestan & Eyberg, 1998; Gross et al., 2003; Moffitt, 1993; Reid et al., 2004; Spoth et al., 1998; Taylor & Biglan, 1998; Webster-Stratton & Reid, 2003a; Webster-Stratton & Taylor, 2001; Webster-Stratton et al., 2001;Yoshikawa, 1994). Tremblay (2000) posited that parent-training programs during the preschool

* Corresponding author: Kimberly Sidora-Arcoleo, PhD, MPH.
E-mail addresses: kimberly.arcoleo@asu.edu (K. Sidora-Arcoleo), elizabeth_anson@urmc.rochester.edu (E. Anson), mlorber@scrippscollege.edu (M. Lorber), robert_cole@urmc.rochester.edu (R. Cole), david.olds@uchsc.edu (D. Olds), harriet_kitzman@urmc.rochester.edu (H. Kitzman).

0882-5963/$ – see front matter © 2010 Elsevier Inc. All rights reserved.
doi:10.1016/j.pedn.2008.07.011

years which address discipline issues, use of physical punishment, and the regulation of physical aggression help prevent the trajectory toward further behavioral problems such as delinquency, truancy, and adolescent violence.

One challenge to implementing prevention and intervention programs is determining the format for delivering the intervention: group-based versus home-based programs or a combination of these two approaches. Most parent-training programs are group based. Brestan and Eyberg (1998) noted in their review of 82 studies on psychosocial treatments for children with conduct disorder that only 11% of the interventions took place in the home, and more than half were conducted in a group format. Sanders et al. (2002) have developed a group-based comprehensive behavioral family intervention aimed at preventing severe behavioral and emotional disturbances in children through having parenting skills training, improving parents' sense of their competency regarding their parenting abilities, increasing parents' communication about parenting issues, and reducing parenting stress (Sanders et al., 2002). This program, known as the Triple P-Positive Parenting Program, has been tested in a wide variety of settings, with sample sizes ranging from 16 to 1,615 (Sanders et al., 2002). A unique feature of the Triple P program is the multilevel concentration of the intervention. The intensity level of the intervention can be tailored to meet the needs of the child and family. This program has demonstrated consistent, sustained effects on reductions in children's disruptive behaviors and increased parental confidence over time and across the age continuum from birth through the age of 12 years (Sanders et al., 2002).

The Incredible Years program is a comprehensive, multifaceted, developmentally based preventive intervention delivered in a group setting, which contains training components for parents, teachers, and children (Webster-Stratton, 1998). This program has been identified as 1 of 11 model programs under the Blueprints for Violence Prevention initiative (http://www.colorado.edu/cspv/blueprints/model/overview.html). The parent-training program focuses on teaching effective parenting skills, positive discipline strategies, and methods for parents to enhance their children's social skills, emotional language building, and prosocial behaviors. The teacher-training components are designed to reinforce the parent program and to provide effective strategies for promoting social competence and managing misbehavior in the classroom. The child-training program emphasizes skill building in emotional literacy, empathy, anger management, and interpersonal problem solving (Webster-Stratton, 1998; Bauer & Webster-Stratton, 2006). This program has demonstrated sustained long-term outcomes in families of children aged 2–10 years who are at risk of having conduct problems (http://www.colorado.edu/cspv/blueprints/model/overview.html).

Although these two group-based parent-training programs have demonstrated positive outcomes for parents and children, delivering the training program in the home may be more advantageous in that the parents do not have to arrange for transportation, child care, or even time off from work which may improve retention in the program. Home visiting programs for first-time parents have garnered attention as effective parent-training strategies which impact a host of parent and child outcomes (McNaughton, 2004; Kearney, York, & Deatrick, 2000; Austin & Lemon, 2005; Fetrick, Christensen, & Mitchell, 2003; Olds, Sadler, & Kitzman, 2007), and these programs are typically targeted to those parents at highest risk of poor outcomes. "Bringing the intervention into the home also provides opportunity for more whole family involvement, personalized service, individual attention, and rapport building" (Sweet & Applebaum, 2004, p. 1435). A meta-analysis on the effectiveness of home visiting programs revealed that families who were targeted as being "at risk," visited by professionals, and who had a larger number of visits over a longer period demonstrated greater improvements in child cognition and child abuse outcomes (Sweet & Applebaum, 2004).

The Nurse–Family Partnership (NFP), an intensive nurse home visiting program, targets first-time low-income mothers and begins during pregnancy and continues until the child is 2 years old. The NFP has demonstrated consistent program effects on parenting behaviors and children's verbal ability, cognition, and executive function (Kitzman et al., 1997, 2000; Olds, Henderson, Tatelbaum, & Chamberlin, 1988; Olds, Kitzman, et al., 2004; Olds et al., 2002; Olds, Robinson et al., 2004). The NFP is 1 of 11 programs identified by the Center for the Study and Prevention of Violence (2007) as a model program in its Blueprints for Violence Prevention initiative (http://www.colorado.edu/cspv/blueprints/model/overview.html). Results from a 15-year follow-up of adolescents from the Elmira NFP trial revealed that there was a 59% reduction in arrests and a 90% reduction in adjudications as person in need of supervision among the nurse-visited group (Olds et al., 1998), outcomes linked to early aggressive behavior during childhood (Broidy et al., 2003; Fergusson & Horwood, 2002; Moffitt & Caspi, 2001; Moffitt, Caspi, Rutter, & Silva, 2001; Moffitt et al., 1996; Nagin & Tremblay, 1999, 2001; Reis & Roth, 1993; Tremblay, 2000, 2004).

Differential Effects of Intervention

Studies have shown that boys consistently have higher rates of physically aggressive behaviors than those of girls from early childhood to adolescence (Broidy et al., 2003), with early-childhood-onset (prior to adolescence) physical aggression having a 10:1 boy-to-girl ratio (Moffitt, 1993; Moffitt et al., 2001, 1996). Moffitt et al. (2001) found that males scored significantly higher than did females on every measure of physically aggressive or violent behavior between ages of 5 and 21 years. Given these gender differences in physically aggressive behavior, surprisingly, few studies were found which examined the effectiveness of