Children and Youth Services Review 33 (2011) 1761–1766

Contents lists available at ScienceDirect

Children and Youth Services Review

journal homepage: www.elsevier.com/locate/childyouth

Randomized trial of the healthy families Arizona home visiting program

Craig Winston LeCroy *, Judy Krysik [1]

Arizona State University,United States

ARTICLE INFO

Article history:
Received 26 January 2011
Received in revised form 26 April 2011
Accepted 26 April 2011
Available online 10 May 2011

Keywords:
Home visitation
Randomized controlled trial
Healthy Families
Child abuse
Prevention

ABSTRACT

The purpose of this paper was to examine the effectiveness of home visiting as a means of improving parental, child, and maternal outcomes and preventing child abuse and neglect. A randomized controlled trial was conducted in a large southwestern metropolitan area. One hundred and ninety-five women were randomly assigned to the Healthy Families Arizona experimental or control conditions. Significant results favoring the experimental group in contrast to the control group were found on some measures in each of five domains including violent parenting behavior, parenting attitudes and practices, parenting support, mental health and coping, and maternal outcomes.

1. Introduction

Home visitation is a method of service delivery that has been growing in popularity for the past several years. Home visitation programs are intended to impact a wide variety of outcomes such as child abuse and neglect, parent-child attachment, parenting behaviors, parent self efficacy, self sufficiency, child development, and school readiness. The driving motivation behind these programs is the belief that early childhood constitutes an ideal opportunity to identify at-risk families and improve future outcomes through home-based interventions. Home visitation has become a widely used method of delivering services because reaching parents through school or community settings often results in poor outreach to and engagement of the neediest families. Currently there are several home visiting programs being implemented on a national level (e.g., Healthy Families America, Nurse Family Partnership, and Parents as Teachers).

Given the widespread adoption of home visitation as a prevention strategy, there continues to be a national focus on the effectiveness of such programs. This study focuses on the evaluation of the Healthy Families America program model (Harding, Reid, Oshana, & Holton, 2004). One of the first rigorous studies of a Healthy Families America program was conducted in Hawaii (Duggan et al., 2004). The overall results found that the program "did not prevent child abuse or promote use of nonviolent discipline; it had a modest impact in preventing neglect" (p. 598). This study led to considerable controversy over the program's effectiveness (Chaffin, 2004; Hahn, Mercy, Bilukha, & Briss, 2005; Oshana, Harding, Friedman, & Holton, 2005). A significant issue raised by this evaluation was the quality of program implementation. As Duggan et al. (p. 61) note, "We believe that the program's implementation system contributed to its minimal impact on maltreatment." Indeed, it is likely that the randomized trial of the program's effectiveness was premature given the difficulties present in program implementation.

The Hawaii study was followed by a similar study in Alaska (Caldera et al., 2007). The findings of this evaluation were more positive, showing children in the Healthy Families group possessing more favorable developmental and behavioral outcomes when compared to children in the control group. The parents in the control and Healthy Families groups had similar parenting outcomes, however, the Healthy Families parents showed greater self efficacy, a better home environment for learning, and were more likely to use center-based parenting services. Perhaps most disappointing was that there were no differences in the frequencies of disciplinary strategies including mild physical strategies. Caldera et al. also noted that although program implementation was improved over the Hawaii program, there were still important concerns including duration of enrollment and visit frequency. It is important to note that the Alaska Healthy Families program did not have a quality assurance aspect and was not accredited by Healthy Families America — the national accrediting organization.

The most recent study of the Healthy Families America model is from New York (DuMont et al., 2008). Unlike the previous studies of the Healthy Families America programs that were based on women

* Corresponding author at: ASU School of Social Work, 340 N. Commerce Park Loop, Tucson, AZ 85745. Tel.: +1 520 419 2824; fax: +1 520 884 5949.
E-mail addresses: craig.lecroy@asu.edu (C.W. LeCroy), judy.krysik@asu.edu (J. Krysik).
[1] ASU School of Social Work, Mail Code 3920, 411N. Central Ave., Suite 800, Phoenix, AZ 85004-0689. Tel.: +1 602 496 0086; fax: +1 602 496 0960.

0190-7409/$ – see front matter © 2011 Elsevier Ltd. All rights reserved.
doi:10.1016/j.childyouth.2011.04.036

who had already given birth, the New York study included women randomly assigned to the experimental or control group prior to the birth of the child, as well as women assigned to experimental or control groups after the birth of their first or subsequent child. Results revealed that the Healthy Families New York program significantly reduced the frequency of serious physical abuse when contrasted with the control condition. This program effect was most pronounced in a subgroup of women who were provided the program prenatally. Further, for women with psychological vulnerabilities the program appeared to buffer the effect of their vulnerabilities.

As cited above, a specific body of evidence is accumulating regarding the efficacy of the Healthy Families America home visitation model. Both the Hawaii study and the Alaska study reported difficulties in program implementation. Further, each of these states represents a very different population and results may not generalize to other diverse parts of the country. The New York study sheds new light on the program's potential impact on abusive and neglectful behavior, but does not examine the program's impact on other important outcomes. The present study adds to this existing literature by examining the effectiveness of the Healthy Families America program model in a state that included an extensive quality assurance program and that had obtained statewide accreditation. Furthermore, the present study extends the examination of potential outcomes by including several additional measures to test broader aspects of the program's impact.

2. Methods

Healthy Families Arizona is based on the national Healthy Families America program model (Healthy Families America, 2009). The overall goals of the program are to promote positive parenting, enhance child health and development, and prevent child abuse and neglect. The Healthy Families program is built on a set of research-based "critical elements" that provide a benchmark against which quality is assessed. Programs can conduct self studies, undergo a review of program documentation regarding implementation, and receive site visits to become accredited. The Healthy Families Arizona program is accredited and has been in operation in the state since 1991 — one of the first Healthy Families programs following Hawaii's original program (Hawaii Family Stress Center, 1991).

Healthy Families Arizona works with prenatal and new parents to provide a range of services and supports. Families agree to participate and receive home visiting services after being screened in the hospital and meeting cut off scores that identify families at risk who can benefit from services. After establishing a trusting relationship, the home visitor assists in helping parents with their life circumstances, personal issues, parenting needs, and successful adaptation to new infants. Home visitors are also available to help mobilize critical services to address substance abuse, domestic violence, and mental health issues. They attempt to model good parenting behavior, review the child's developmental progress, ensure safety in the home, secure a "medical home" for the child, and provide emotional support to the parents as they adapt to the changing circumstances of their home life.

This study focused on a single site in a large metropolitan area in Arizona. The program site has been delivering services since 1991. The home visitors all received the core training recommended by Healthy Families America and participated in additional training. The program was monitored for quality assurance by trained staff who had worked with Healthy Families Arizona for many years. The home visitors, all female, either had a baccalaureate degree or an equivalent number of years experience. Many had worked with the program for several years. To the extent possible, home visitors were unaware of which families were in the experimental group so as to not bias the delivery of the Healthy Families Arizona program in a way that would influence the RCT or deviate from practice as usual.

A randomized experimental design was used whereby following assessment and meeting Healthy Families Arizona criteria families were randomly assigned to either the Healthy Families experimental group or the alternative Child Development control group. Those assigned to the experimental group received the normal course of services from the Healthy Families Arizona program and those assigned to the Child Development group received assessment information about their child's developmental progress. This was deemed a minimal level of information that would still be valuable enough for participants to agree to participate in the study and agree to continue participation throughout the study period. The protocol for the study obtained IRB approval prior to commencement of the study.

Fig. 1 outlines the screening and enrollment process for the study. As the figure shows, a 15-item screen assessing at-risk criteria such as teenage mother was administered and a positive score led to a parent survey, a modified version of the Kempe Family Checklist. If the score on the survey was 25 or greater for either parent then participation in the study was offered. If the parent accepted participation, then random assignment to either the Healthy Families Arizona program or the Arizona Child Development Study (the control condition) was offered. During recruitment, 195 families entered the study (97 experimental and 98 control) and 100% completed the baseline assessment. At six months, 91% of the control group and 94% of the Healthy Families group were retained. At the one year assessment the control group had lost 11 families (89% retention) and the Healthy Families group had lost 13 families (88% retention). The original intent was to collect data over a 5-year period; however, after the economic downturn the funding for the study was eliminated. This paper reports the results of the first wave of data collection.

3. Data collection and measurement

3.1. Violent behavior

The primary outcome measure is mother's disciplinary practices and violence in the home. This measure was based on a modified version of the Revised Parent-Child Conflict Tactics Scale (Straus,

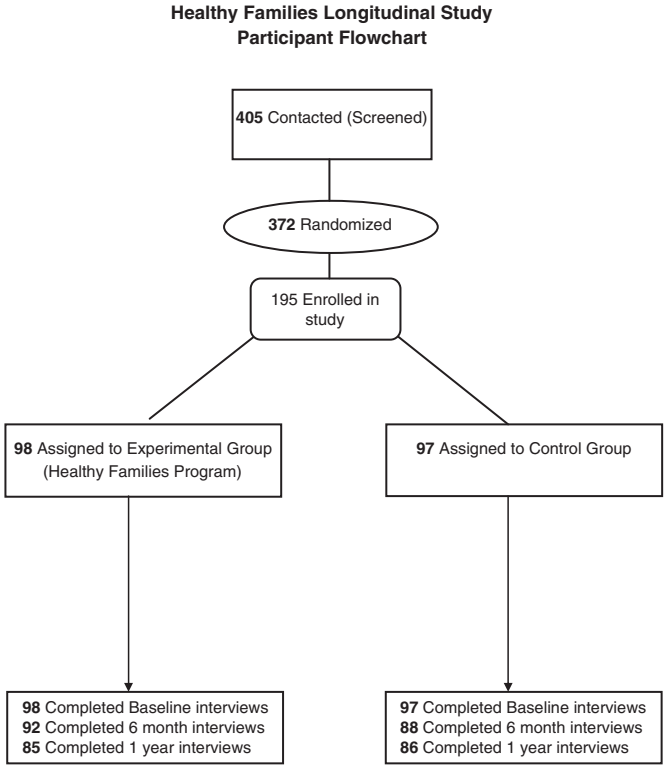

Fig. 1. Study flowchart.

Hamby, Finkelhor, Moore, & Runyan, 1998). The measure records how often a mother engages in specific behaviors that reflect neglectful and abusive behaviors. A short version was created using the most serious indicators of abusive and neglectful behavior and was administered at one year as this is the period when parents are apt to react more punitively to their infants. This approach to measuring abusive acts has been found to be reliable (.60–.95) and valid (DuMont et al., 2008; Straus et al., 1998).

Because domestic violence often co-occurs with child abuse and neglect (Appel & Holden, 1998) a measure of family violence was considered an important outcome of interest. Based on common indicators of violence an index was created. The items were similar to those included in the Conflict Tactics Scale (Straus et al., 1998). The index included items that describe violent behaviors in the home such as pushing and shoving, slapping, and throwing objects. This approach to measuring family violence has been found to be reliable (.79–.95) and valid (Jones, Ji, Beck, & Beck, 2002).

3.2. Parenting attitudes and practices

The Adult-Adolescent Parenting Inventory-2 (AAPI) was used for this study in its original form to assess the child rearing attitudes of parents. The AAPI includes five subscales: inappropriate expectations, parental lack of empathy, parental belief in corporal punishment, reversing parent-child family roles, and oppressing children's power and independence. The scale has demonstrated adequate reliability (.70 to .86 for subscales) and validity (Bavolek, 1994). Safety practices and mother's reading were additional indexes that are used in the ongoing evaluation of the program and which were adapted for this study. Safety practices included a list of items that were validated as true or false such as parent has a car seat, poisons are not within child's reach, and so forth. Mother's reading was a self-reported estimate of the time spent reading to the child on a weekly basis.

3.3. Parenting support

Parenting support was measured by the use of resources. This scale was created for this study and included endorsements of the number of resources the family reported using. Examples of resources include mental health counseling, financial counseling, center-based family assistance, and so forth.

3.4. Mental health and coping

The Emotional/Social Loneliness Inventory was used in its original form to examine coping and the sense of isolation — factors known to be predictive of child abuse (Coohey, 1996). This scale examines social and emotional loneliness and has established reliability (.89–.93) and validity (DiTommaso & Spinner, 1993). The other measure included was a subscale of the Adult Hope Scale. The Adult Hope Scale has two subscales, one that measures self efficacy related to the pursuit of goals, and the other that measures the ability to plan for personal goal achievement, referred to as pathway to goals. The later subscale was used in its original form as it more directly reflected the program's focus. This scale has been used in a number of studies with good reliability (.74–.88) and validity (Cramer & Dyrkacz, 1998). Alcohol use was measured by a series of questions that included: Do you drink beer or alcohol? To which the mother could answer yes or no. If the mother answered yes, then another question was asked: In the past two weeks how many times did you drink beer or alcohol?

3.5. Maternal outcomes

Two indicators of maternal outcomes were examined. The first was the participant's involvement in training or school. This was as assessment of whether the person had enrolled and was attending training or school for advancement and was based on self report. The second was parent self report of the consistent use of birth control since last birth.

The results of this study are based on an intent-to-treat analysis of the data. The two groups were tested for baseline comparability. Some differences between the groups were found, therefore, the analysis used an ANCOVA model to covary out any differences between the two groups. The analysis used a series of a priori contrasts. A goal of this study was to examine a broad range of potential outcomes to better understand the boundaries of the intervention. Therefore, the dependent measures used were considered conceptually independent (Huberty & Morris, 1989) and each was treated as an independent test. However, measures that were highly correlated with other measures were not included. Since the total N for this study is no larger than 195 it is somewhat underpowered. A p-value $<.05$ for a small effect provides power of .28 and includes a comparison group with some level of intervention making detection of impact more difficult (Abelson, 1995). Therefore, we defined statistical significance at a level of $p<.10$. Further, this study includes a large number of outcome indicators. We have examined correlations, established primary measures, and in some instances combined measures to reduce the overall number of tests being performed on the data.

4. Results

As shown in Table 1, the experimental and control groups were equivalent on most of the background characteristics; however, demographic characteristics such as mother's average age was significantly younger in the Healthy Families experimental group than the control group. Prenatal and birth characteristics were also similar, however, receipt of prenatal care showed significant differences between the groups. Income related factors showed the most between-group differences. All three indicators of income, health insurance, employment, and car ownership showed statistically significant differences with the control group having less insurance but greater employment and car ownership than the experimental group. Additionally, more Healthy Families Arizona mothers reported

Table 1
Comparison of group baseline characteristics.

	Healthy families ($n=98$)	Control group ($n=97$)	Significance
Demographic characteristics			
White	18.6%	23.7%	NS
Hispanic	64.9%	54.6%	NS
Average number children prior to birth	2.0	1.9	NS
Mother's average age in years	23.5	25.4	.03
Prenatal and birth characteristics			
Average birth rate	7.0 lbs	7.0 lbs	NS
Average number of prenatal visits	11.5	12.8	NS
Had any children prior to current birth	56.7%	54.6%	NS
Smoked during pregnancy	21.6%	20.6%	NS
Used alcohol during pregnancy	13.4%	6.2%	NS
Received prenatal care	89.7%	100%	.001
Income related factors			
Health Insurance with AHCCCS	95.7%	84.4%	.01
Mother employed	17.7%	40.2%	.000
Own a car	26.8%	53.6%	.000
History of childhood maltreatment			
Neglected by caretakers	24.7%	21.6%	NS
Emotional abuse	33.0%	19.6%	NS
Sexual abuse	24.7%	21.6%	NS
Involvement with CPS as a parent	24.7%	11.3%	.01

Note. AHCCCS is the state of Arizona Medicaid program.

involvement with Child Protective Services (CPS) as a parent, an important predictor of subsequent CPS reports of child abuse and neglect. Because of these differences, variables with significance were used as covariates in the analysis of the results.

Table 2 presents the primary outcome data describing the parents' self reported use of aggressive and corporal disciplinary activities at a one year assessment. The data in the table represent the percentage of mothers who reported 'never using' select disciplinary practices with their infants from 6 to 12 months of age. The data in the table show that the control group mothers were more likely to use each type of violent discipline than those mothers enrolled in Healthy Families Arizona experimental group. The group differences were statistically significant for verbal aggression including shouting, yelling and screaming at the infant and for minor corporal aggression such as slapping the child's hand. Acts of major physical aggression were rare in both groups. For instance, none of the mothers reported shaking their infants; shoving or pushing; or hitting infants with an object such as a belt, ruler, etc.

Table 3 presents key outcome measures across five different domains including violent behavior, parenting attitudes and practices, parenting support, mental health and coping, and maternal outcomes. In each of the major domains there was a significant outcome for the Healthy Families Arizona experimental group in contrast to the control group. In the violent behavior domain, a count of aggressive discipline practices at one year found a significant difference between the groups ($F = 2.67$ (1, 188), $p < .10$). The measure of family violence did not show a significant difference; however, the outcome favored the experimental group. In the parenting attitudes and practices domain there was one significant difference on the subscales of the AAPI-2 on the index regarding the child's independence at six months. Belief in corporal punishment, a key outcome, was not significantly different between the two groups but favored the Healthy Families Arizona group ($p < .12$). An examination of safety practices showed a significant difference between the two groups at the 6 month assessment. In the safety measure the largest percent differences were in the categories of poisons locked up, water heater turned down, and use of car seats. None of the measures in this domain showed significant results at the 12-month assessment. Parenting support included the use of resources. There were significant differences between the groups at both the 6 and 12 month assessment for use of resources. In the domain of mental health and coping there was a significant difference between the groups on alcohol use. Finally, in terms of maternal outcomes there was a significant difference favoring the Healthy Families Arizona group on enrollment in school or training but not in using consistent birth control at the 6 and 12 month assessments.

5. Discussion

This study assessed the impact of the Healthy Families Arizona home visitation program on a broad range of outcomes. Fundamentally, this was a study of program effectiveness. The results are a beginning effort to examine more closely what outcomes home visitation programs can expect to discover. An important finding of this study was that some outcomes were evident across each of five domains: violent behavior, parenting attitudes and practices, parenting support, mental health and coping, and maternal outcomes.

Table 2
Disciplinary practices reportedly never used with infants age 6 months to 1 year.

	Healthy families ($n = 85$)	Control group ($n = 83$)	Significance
Shouted, yelled, screamed at child	50.6%	34.1%	.02*
Called name, cursed	96.4%	94.1%	.33
Smack/threaten hit	69.5%	63.5%	.30
Slapped hand	56.6%	38.8%	.03*
Spanked	71.1%	65.9%	.19
Hit elsewhere	98.8%	96.5%	.28
Slapped on face	100%	97.6%	.99
Threw object at child	100%	98.8%	.32
Pinched child	98.8%	94.1%	.15

A primary goal of the Healthy Families Arizona program is the reduction of child abuse and neglect. This was assessed using measures of aggressive discipline and family violence. Looking specifically at abusive behaviors, the program found results on two of nine behaviors, shouted, yelled, or screamed at child; and slapped child's hand. The program did not significantly impact spanking which is a key behavior related to aggressive discipline, however the propensity to spank increases during the toddler years and a longer follow up assessment would provide a better test of whether the program can impact this behavior. The program did not show significant results on the measure of family violence. However, when the indicators of violence were examined individually, almost all of them showed a greater decrease for the experimental condition when compared to the control condition. For example, pushed or shoved partner showed a 11.7% decrease in the Healthy Families Arizona group compared to an 8.4% decrease in the control group. Choked or kicked showed a 10.2% decrease for the Healthy Families Arizona group and a 4.6% decrease for the control group, and slapped other showed an 8.4% decrease for the Healthy Families Arizona group and a 3.7% decrease for the control group. Overall, the Healthy Families Arizona program showed a modest impact on behaviors that could be considered physically abusive.

If Healthy Families Arizona is considered a beginning intervention that provides support, resources, and motivation for enhancing parental effectiveness it might be enhanced with the addition of a more discreet parenting skills program like parent management training (Kazdin, 2008) or the Triple P program (Sanders, Cann, & Markie-Dadds, 2003), and outcomes might be strengthened by both types of programs. Recently, a comprehensive evaluation of the Triple P program found significant reductions in cases of maltreatment, injuries, and children being removed from the home as a result of the program (Prinz, Sanders, Shapiro, Whitaker, & Lutzker, 2009). As the infants in the Healthy Families Arizona program transition to toddlers, an important modification to the program may be a more structured component of parent management training (Barth, 1999).

With regard to parenting attitudes and practices, four of the eight measures showed significant impacts in the experimental condition compared to the control condition. Two subscales from the Adult Adolescent Parenting Inventory, inappropriate expectations and oppressing the child's independence, were statistically significant. However, belief in corporal punishment, a key measure, did not show significance ($p < .12$) but could be considered a positive trend in favor of the experimental group. These results suggest the program does positively impact how the parent perceives the child, and helps promote positive parent and child relationships. The use of safety practices also showed a statistically significant improvement related to the experimental group. Interestingly, none of the measures in this domain were statistically significant at the 12 month assessment. Safety is one very concrete factor that the program should be able to impact through direct environmental modification. Accidental childhood injury is an important concern in this country and its influence may have significant social and economic benefits (DiGuiseppi & Roberts, 2000; Kendrick, Barlow, Hampshire, Stewart-Brown, & Polnay, 2008). Unintentional injuries are the leading cause of death for children (Deal, Gomby, Zippiroli, & Behrman, 2000). One study in the UK found that home visits can reduce the risk of accidental injuries in the home by around 26% (Liabo & Lucas, 2004) and this study suggests home visitation can be an important factor in safety. As Barth (1999, p. 103) notes, "although unintentional injury is not the same as child maltreatment, procedures that increase child safety are also likely to decrease neglect charges that stem from failure to supervise."

Table 3
Comparison of outcome measures by group.

Outcome	Healthy families group			Control group			p (6 mo.)	p(1 year)
	Baseline	6 months	1 year	Baseline	6 months	1 year		
	M (SD)	M (SD)	M(SD)					
Violent behavior								
Aggressive discipline			1.44(.16)			1.83(.16)		.10*
Family violence	.69(.14)	.51(.08)	.43(.08)	.79(.14)	.36(.08)	.52(.08)	.15	.37
Parenting attitudes and practices								
Inappropriate expectations	3.33(.55)	3.05(.78)	2.77(.76)	3.33(.61)	2.88(.75)	2.77(.69)	.10*	.91
Lack of empathy	2.45(.50)	1.95(.55)	1.80(.51)	2.37(.56)	1.94(.53)	1.78(.48)	.54	.91
Belief in corporal punishment	2.48(.53)	2.25(.71)	2.21(.73)	2.33(.53)	2.15(.64)	2.23(.62)	.12	.63
Reversing roles	2.96(.78)	2.60(.82)		2.77(.69)	2.47(.66)	2.25(.63)	.32	.33
Oppressing child's Independence	1.99(.53)	3.62(.44)		1.89(.42)	3.58(.39)	3.32(.37)	.06*	.68
Safety practices		17.95(.63)	17.96(.76)		16.05(.63)	17.07(.76)	.04*	.42
Mother's reading		2.46(.16)	2.26(.15)		2.72(.16)	2.22(.15)	.28	.85
Parenting support								
Use of resources	2.45(.15)	2.71(.15)	2.53(.5)	2.03(.13)	2.06(.15)	1.95(.14)	.007*	.001*
Mental health and coping								
Emotional loneliness	1.86(.74)	1.75(.68)		1.63(.72)	1.74(.71)		.34	
Pathways to goal	12.74(.21)	13.0(.19)	12.96(.19)	13.07(.21)	13.17(.19)	12.69(.12)	.12	.87
Alcohol use		16.5%	12.0%		35.2%	20.5%		.04*
Maternal outcomes								
School or training			35.2%			6.8%		.01*
Using birth control	67.8%	65.8%			65.1%	72.2%	.61	.54

Although the Healthy Families Arizona program does promote reading and is often considered an important aspect to early childhood education, an assessment of mother's reading to their children did not show a significant difference between the Healthy Families Arizona experimental and control groups. As more expectations such as promoting early childhood education through reading are emphasized in home visitation programs it will be important to assess the potential impact of such modifications.

The domain of parenting support included the use of resources. The Healthy Families Arizona experimental group had a significant impact on participant's use of resources at both the 6 and 12-month assessments. A major aspect of the Healthy Families Arizona is helping families identify and utilize resources in their communities. This may be an overlooked outcome because the manner in which families identify and use resources may prevent them from experiencing future problems. In a qualitative study of Healthy Families Arizona participants, Krysik, LeCroy, and Ashford (2008) found that many families had previous negative experiences with social service programs until their exposure to the Healthy Families Arizona program. The authors note "Home visitation programs such as Healthy Families may provide a positive experience for families that will promote future involvement with other social service programs when families need help in the future" (Krysik et al., 2008, p.59).

In the domain of mental health and coping the program significantly impacted alcohol use whereas there were no significant differences on a measure of emotional and social loneliness. An assessment of hope and goal setting showed a trend favoring the Healthy Families experimental group but was not statistically significant. In the implementation of the Healthy Families Arizona program there is a strong emphasis on working with family members on establishing goals, so it is surprising that this fairly direct measure did not show a strong difference between the two groups. In recent years the program had put an emphasis on motivational interviewing and increased attempts to address alcohol and drug use. It appears that these efforts may have led to significant reductions in use. Given the strong relationship between substance use and child abuse and neglect (Harter & Taylor, 2000) this is considered a strong finding for the program's effectiveness. Depression has been an ongoing emphasis in many Healthy Families programs and indeed in this study 35% of the participants scored above the clinical cutoff score on the Center for Epidemiologic Studies Depression Scale (CES-D). Unfortunately, the depression measure used at six and 12 months did not prove to be reliable and the scores could not be interpreted due to the low alphas. Home visitation programs have also increased their staff to include professional counselors hoping to provide stronger clinical services. Ongoing evaluation will need to determine how this addition is impacting outcomes especially in the mental health area.

Finally, in the domain of maternal outcomes two primary indicators were examined, participation in school and training and consistent use of birth control. The Healthy Families Arizona program documented a large participation in school or training when compared to the control group and the difference was statistically significant. A key aspect of the program is helping mothers set concrete goals and encouraging mothers to pursue training and school opportunities. This is an important finding because gains in education and training can have an impact on reduced poverty which is strongly related to poor child outcomes (Aber & Nieto, 2000; Lindsey, 2004). No group differences were found in terms of the use of birth control. Past evaluations of this program have consistently not found differences in either birth control use or birth spacing and this is an important maternal outcome that the program should work to improve.

Although there is a strong push toward the use of evidence based practices in home visitation, our work suggests that much more research and learning are needed. There are still too few rigorous trials of program models and measurement issues remain serious threats to understanding the capacity of programs to produce important outcomes (LeCroy & Krysik, 2010). This study is limited to only 6 month and 1 year follow-up assessments and a longer term outcome assessment may have shed a different light on the potential long term outcomes. Researchers need to continue to pursue outcomes relevant in both the short and long term. Sample size did not allow for a complete analysis of subgroups, however, other studies (DuMont et al., 2008; Olds et al., 2004) have reported enhanced effectiveness depending on the subgroup such as first time mothers and mothers with low psychological resources.

Modest outcomes were found in this study and this may reflect the difficulty in obtaining equivalent experimental and control groups as well as the use of a "child development" control group. Despite the randomization, the Healthy Families Arizona experimental and control groups were not equivalent. Clearly, the Healthy Families Arizona experimental group had greater at-risk characteristics than the control group. Although efforts were made to control for such differences in the analysis, the outcomes may have been stronger if the groups had been truly equivalent. Furthermore, the control group offered parents information about their child's development and shared the results of assessments with the families. Consistent and long-term positive relationships were established between the research assistants and the mothers in the control group. Also, control group families were offered opportunities to access services if desired. These enhancements to keep participants enrolled in the study likely diminished the magnitude of the differences between the experimental and control groups on the outcome indicators.

Official child protective reports were not examined, however, these reports are not recommended as valid outcome measures (Daro & Harding, 1999; Gomby, Colross, & Behrman, 1999; Olds, Henderson, Kitzman, & Cole, 1995) and have been found to show surveillance bias (see Barth, 1999; DuMont et al., 2006). In a meta analysis of home visitation studies Geeraert, Noortgate, Grietens, and Onghena (2004) concluded that measurement of child maltreatment is difficult due to a lack of established validity with official reports and the low rate of abuse in the population which requires large numbers to show significant changes. The authors recommend multiple outcome measures.

Home visitation programs such as Healthy Families America remain an important strategy for delivering a large number of services to a well defined target group. Although past research on home visitation has focused on reductions in child abuse and neglect, this study found that additional outcomes could be achieved. Indeed, home visitation services allow for enormous opportunities to impact families — from less aggressive discipline practices, improved parenting practices, enhanced safety practices in the home, greater use of community resources, less alcohol use, and maternal life course outcomes. Research should continue to examine the broad array of potential outcomes that may be achievable in home visitation services.

Acknowledgements

This study was funded by the Arizona Department of Economic Security. The authors would like to acknowledge the support of Karen Bulkeley, Manager, Office of Prevention and Family Support.

References

Abelson, R. P. (1995). *Statistics as principled argument.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Aber, M. S., & Nieto, M. (2000). Suggestions for the investigation of psychological wellness in the neighborhood context: Toward a pluralistic neighborhood theory. In D. Cicchetti, J. Rappaport, I. Sandler, & R. P. Weissberg (Eds.), *The promotion of wellness in children and adolescents* (pp. 185–220). Washington DC: Child Welfare League of America.

Appel, A. E., & Holden, G. W. (1998). Co-occurring spouse and child abuse: Implications for CPS practice. *APSAC Advisor*, *11*, 11–14.

Barth, R. (1999). Preventing child abuse and neglect with parent training: Evidence and opportunities. *The Future of Children*, *19*, 95–118.

Bavolek, S. J. (1994). Adult-Adolescent Parenting Inventory. In J. Fischer, & K. Corcoran (Eds.), *Measures for clinical practice* (pp. 87–89). New York: Oxford University Press.

Caldera, D., Burrell, L., Rodriguez, K., Crowne, S. S., Rohde, C., & Duggan, A. (2007). Impact of a statewide home visitation program on parenting and on child health and development. *Child Abuse & Neglect*, *31*, 829–852.

Chaffin, M. (2004). Is it time to rethink Healthy Start/Healthy Families? *Child Abuse & Neglect*, *28*, 589–595.

Coohey, C. (1996). Child maltreatment: Testing the social isolation hypothesis. *Child Abuse & Neglect*, *20*, 241–254.

Cramer, K. M., & Dyrkacz, L. (1998). Differential prediction of maladjustment scores with the Snyder Hope subscales. *Psychological Reports*, *83*, 1035–1041.

Daro, D., & Harding, K. (1999). Healthy Families America: Using research to enhance practice. *The Future of Children*, *9*, 152–176.

Deal, L. W., Gomby, D. S., Zippiroli, L., & Behrman, R. E. (2000). Unintentional injuries in childhood: Analysis and recommendations. *The Future of Children*, *10*, 4–22.

DiGuiseppi, C., & Roberts, I. G. (2000). Individual-level injury prevention strategies in the clinical setting. *The Future of Children*, *10*, 53–62.

DiTommaso, E., & Spinner, B. (1993). The development and initial validation of the Social and Emotional Loneliness Scale for Adults (SELSA). *Personality and Individual Differences*, *14*, 127–134.

Duggan, A., McFarlane, E., Fuddy, L., Burrell, L., Higman, S. M., Windham, A., & Sia, C. (2004). Randomized trial of a statewide home visiting program: Impact in preventing child abuse and neglect. *Child Abuse & Neglect*, *28*, 597–622.

DuMont, K. A., Mitchell-Herzfeld, S., Greene, R., Lee, E., Lowenfels, A., & Rodriguez, M. (2006). Healthy Families New York (NFNY) Randomized Trial: Impacts on parenting after the first two years. Retrieved from: http://www.ocfs.state.ny.us/main/reports/.

DuMont, K., Mitchell-Herzfeld, S., Greene, R., Lee, E., Lowenfels, A., Rodriguez, M., & Dorabawila, V. (2008). Healthy Families New York (HFNY) randomized trial: Effects on early child abuse and neglect. *Child Abuse & Neglect*, *32*, 295–315.

Geeraert, L., Noortgate, W. V., Grietens, H., & Onghena, P. (2004). The effects of early prevention programs for families with young children at risk for physical child abuse and neglect: A meta-analysis. *Child Maltreatment*, *9*, 277–291.

Gomby, D., Colross, P., & Behrman, R. (1999). Home visiting: Recent program evaluations—analysis and recommendations. *The Future of Children*, *9*, 27–43.

Hahn, R., Mercy, J., Bilukha, O., & Briss, P. (2005). Assessing home visiting programs to prevent child abuse: Taking silver and bronze along with gold. *Child Abuse & Neglect*, *29*, 215–218.

Harding, K., Reid, R., Oshana, D., & Holton, J. (2004). *Initial results of the HFA implementation study.* Chicago, IL: Prevent Child Abuse America.

Harter, S. L., & Taylor, T. L. (2000). Parental alcoholism, child abuse, and adult adjustment. *Journal of Substance Abuse*, *11*, 31–44.

Hawaii Family Stress Center (1991). *The Healthy Start training manual.* Honolulu, HI: Hawaii Family Stress Center.

Healthy Families America (2009). Retrieved from: http://www.healthyfamiliesamerica.org/about_uus/index.shtml.

Huberty, C. J., & Morris, J. D. (1989). Multivariate analysis versus multiple univariate analyses. *Psychological Bulletin*, *105*, 302–308.

Jones, N. T., Ji, P., Beck, M., & Beck, N. (2002). The reliability and validity of the Revised Conflict Tactics Scale (CTS2) in a female incarcerated population. *Journal of Family Issues*, *23*, 441–457.

Kazdin, A. E. (2008). *Parent management training: Treatment for oppositional, aggressive, and antisocial behavior in children and adolescents.* New York: Oxford University Press.

Kendrick, D., Barlow, J., Hampshire, A., Stewart-Brown, S., & Polnay, L. (2008). Parenting interventions and the prevention of unintentional injuries in childhood: Systematic review and meta-analysis. *Child: Care, Health and Development*, *34*, 682–695.

Krysik, J., LeCroy, C. W., & Ashford, J. B. (2008). Participants' perceptions of Healthy Families: A home visitation program to prevent child abuse and neglect. *Child and Youth Services Review*, *30*, 45–61.

LeCroy, C. W., & Krysik, J. (2010). Measurement issues in home visitation. *Child and Youth Services Review*, *32*, 1483–1486.

Liabo, K., & Lucas, P. (2004). *Home visiting and childhood injuries.* Highlight no. 213, National Children's Bureau, What works for children York, UK.

Lindsey, D. (2004). *The welfare of children.* New York: Oxford University Press.

Olds, D. L., Henderson, C. R., Kitzman, H., & Cole, R. (1995). Effects of prenatal and infancy nurse home visitation on surveillance of child maltreatment. *Pediatrics*, *95*, 365–372.

Olds, D. L., Robinson, J., Pettitt, L., Luckey, D. W., Homberg, J., Ng, R. K., Isacks, K., Sheff, K., & Henderson, C. R. (2004). Effects of home visits by paraprofessionals and by nurses: Age 4 follow-up results of a randomized trial. *Pediatrics*, *114*, 1560–1568.

Oshana, D., Harding, K., Friedman, L., & Holton, J. K. (2005). Rethinking Healthy Families: A continuous responsibility. *Child Abuse & Neglect*, *29*, 219–228.

Prinz, R., Sanders, M. R., Shapiro, C. J., Whitaker, D. J., & Lutzker, J. R. (2009). Population-based prevention for child maltreatment: The U.S. Triple P System population trial. *Prevention Science.* doi:10.1007/s11121-009-0123-3 published online January 22, 2009.

Sanders, M., Cann, W., & Markie-Dadds, C. (2003). The Triple P-Positive Programme: A universal population-level approach to the prevention of child abuse. *Child Abuse Review*, *12*, 155–171.

Straus, M. A., Hamby, S. L., Finkelhor, D., Moore, D. W., & Runyan, D. (1998). Identification of child maltreatment with the Parent-Child Conflict Tactics Scales: Development and psychometric data for a national sample of American parents. *Child Abuse & Neglect*, *22*, 249–270.