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Enhancing home-based childcare quality through video-feedback intervention: A randomized controlled trial

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ABSTRACT

In the current randomized controlled trial, the effectiveness of Video-feedback Intervention to promote Positive Parenting – Child Care (VIPP-CC) was tested in home-based childcare. Forty-eight caregivers were randomly assigned to the intervention group or control group. Caregivers scoring high on sensitivity ($n = 37$) served as an additional comparison group. Global childcare quality improved in the intervention group, but not in the control group. Although the program did not change observed caregiver sensitivity, caregivers in the intervention group showed a more positive attitude towards sensitive caregiving than caregivers in the control group. The study shows that the family-based intervention can be applied with some minor modifications in a professional group setting as well. The brief VIPP-CC program is an important tool for enhancing quality of home-based child care.

Keywords: home-based childcare, quality of care, randomized controlled trial, sensitivity, video-based intervention

INTRODUCTION

Home-based childcare has become a commonly used type of care. The NICHD Early Child Care Research Network reported that 24% of the children in their sample visited home-based childcare at entry in childcare (NICHD ECCRN, 1997). In the Netherlands, the number of children visiting home-based childcare has been increasing rapidly. Whereas in 2006, 70.000 children visited home-based childcare, this number had increased to 140.000 children one year later (Statistics Netherlands, 2008a). Home-based childcare is provided from a caregiver's personal home and is, in the Netherlands, restricted to a maximum of six children under the age of four, which makes the daily environment more similar to a child's home than center-based childcare. The quality of care these caregivers provide is crucial for the children's feeling of security and their development (NICHD ECCRN, 2005; Vandell, Belsky, Burchinal, Steinberg, Vandergrift, & NICHD ECCRN, 2010). In this study, a video-intervention is implemented in

home-based childcare using a randomized controlled design with the aim to enhance childcare quality. Two indicators of childcare quality are central: global quality and caregiver sensitivity.

Global quality

Global quality refers to the stimulation and support available to children in the childcare home environment, for example organization of the environment, (learning) materials available to the children, and variety in events and environments. In general, children who visit higher quality childcare homes or centers have better cognitive and social skills than children experiencing lower quality childcare (Peisner-Feinberg et al., 2001; Vandell & Wolfe, 2000). In the physiological domain, results from cortisol studies point in the direction of an association between lower-quality care and higher cortisol levels in children in childcare homes (Dettling, Parker, Lane, Sebanc, & Gunnar, 2000) and childcare centers (Dettling et al., 2000; Groeneveld, Vermeer, Van IJzendoorn, & Linting, 2010; Sims, Guilfoyle, & Perry, 2006).

Sensitive caregiving

Sensitive caregiving facilitates children to build a secure relationship with their caregiver. According to attachment theory, children use their caregivers as a haven of safety, from which they can explore the environment (Bowlby, 1969). Parental sensitivity is a determinant of children's attachment security (De Wolff & Van IJzendoorn, 1997) and can be defined as the ability to accurately perceive the child's signals and to respond promptly and adequately to these signals (Ainsworth, Blehar, Waters, & Wall, 1978). Several studies have shown that children do not only form attachment relationships with their parents, but also with professional caregivers in childcare, and that attachment security was predicted by caregiver sensitivity (Elicker, Fortner-Wood, & Noppe, 1999; Goossens & Van IJzendoorn, 1990).

Role of caregiver education and training

Several studies have shown that caregiver education is a predictor of caregiver sensitivity and quality of care in childcare homes (Clarke-Stewart, Lowe Vandell, Burchinal, O'Brien, & McCatney, 2002; Doherty, Forer, Lero, Goelman, & LaGrange, 2006). In the Netherlands, most caregivers in home-based childcare have limited or no education in childcare. In a recent Dutch study, only 30% of the caregivers in home-based childcare reported to have completed an education in childcare, whereas all caregivers in center-based childcare completed a vocational education directed at various domains of care (Groeneveld et al., 2010). For center-based childcare, Burchinal, Cryer, Clifford, and Howes (2002) showed that not only caregivers with formal education in early childhood, but also caregivers who attended to informal workshops scored higher on caregiver sensitivity and quality of care. The importance of caregiver training, beyond caregiver education, has also been demonstrated in home-based childcare (Burchinal, Howes, & Kontos, 2002; Clarke-Stewart et al., 2002). In the present study, we implemented a caregiver training to enhance childcare quality in

home-based childcare. Before selecting an effective intervention for childcare homes, several existing interventions were reviewed, focusing on families and childcare homes.

Interventions in families

Programs aimed at enhancing parental sensitivity have been studied more often than programs directed at professional caregivers' sensitivity. Bakermans-Kranenburg, Van IJzendoorn, and Juffer (2003) conducted a meta-analysis of 80 studies to test the effectiveness of various types of interventions for enhancing maternal sensitivity. This 'Less is more' meta-analysis showed that interventions that (1) only focused on sensitivity, (2) made use of video-feedback, and (3) consisted of less than 16 intervention sessions were more effective than interventions with a broader focus, without video-feedback, and with more intervention sessions. Based on this meta-analysis, a short-term, behaviorally focused intervention program was developed: Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD; Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2008). Based on both attachment theory (Ainsworth et al., 1978; Bowlby, 1969) and coercion theory (Patterson, 1982), the goal of VIPP-SD is to enhance parental sensitivity as well as sensitive discipline. Mother and child are videotaped during daily situations at home. Videotaped episodes are discussed with the mother, focusing on various parts of sensitivity as defined by Ainsworth (Ainsworth et al., 1978). First, during the videotaped episodes the intervener focuses on observing the child's signals in an accurate way. Second, through positive reinforcement of the mother's sensitive behavior shown on the videotape, the mother is reinforced to respond to the child's signals in an adequate and prompt way.

Studies using the VIPP approach showed positive effects on parental sensitivity in intervention groups compared to control groups in various samples: insecure mothers (Klein Velderman, Bakermans-Kranenburg, Juffer, & Van IJzendoorn, 2006), insensitive mothers (Kalinauskiene, Cekuoliene, Van IJzendoorn, Bakermans-Kranenburg, Juffer, & Kusakovskaja, 2009), mothers with eating disorders (Stein et al., 2006), adoptive mothers (Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2005b), and mothers of children with externalizing problems (Van Zeijl et al., 2006, for an overview see Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2009).

Interventions in home-based childcare

The effectiveness of the project Rural Early Childhood Educational Institute (REACH) was tested in a group of caregivers from childcare homes ($n = 62$) and childcare centers ($n = 39$) (Espinosa, Mathews, Thornburg, & Ispa, 1999). This training program was individualized, since caregivers decided themselves how often they attended the training, and whether they preferred group workshops and/ or received home-visits. Immediately after the project, improvements were present in global quality, sensitivity, and caregiver attitudes. However, during follow up ten months later a decline in global quality was present although global quality was still higher than prior to the intervention. No control group was present.

The effectiveness of only three other programs in home-based childcare has been tested. Aguirre and Marshall (1998) tested the effectiveness of a self-instructional training program for home-based caregivers ($n = 437$) directed at health and safety, business management, child development, and nutrition, which combined written material and videotaped material. They found that the program was successful in increasing caregiver knowledge and in changing caregiver-reported behavior. These authors did not measure (changes in) caregiver behavior through observations. As in the REACH project (Espinosa et al., 2009), no control group was present.

Kontos, Howes, and Galinsky (1996) observed global quality of care and sensitivity of caregivers ($n = 95$) in home-based childcare after a broad training. This Family-to-Family training involved 15 to 25 hours of classes (duration and number of sessions varied per site) and home visits. No randomization took place, because caregivers enrolled themselves in the training. The comparison group ($n = 112$) consisted of caregivers who did not enroll themselves in the training program. Although the training had a positive effect on business practices (e.g. providing a parent-caregiver contract, emergency authorization forms), planned activities, and global quality, the training did not affect caregiver sensitivity.

Recently, a randomized controlled trial was published evaluating the Carescapes program: a video-based training program for home-based caregivers to promote positive social development in young children (Rusby, Smolkowski, Marquez, & Taylor, 2008). The intervention consisted of three meetings in which, with the use of a video model, was demonstrated (1) how to support the social development of children, (2) how to manage their behavior, and (3) how to understand and deal with problem behavior. Although the use of effective behavior management practices increased in the intervention group ($n = 33$) compared to those in the waiting list control group ($n = 30$), the use of strategies did not maintain over time: 18 weeks afterwards this increase had disappeared.

Current study

From previous intervention studies performed in families and home-based childcare it can be concluded that interventions tend to be more effective when they have a narrow focus, a fixed-curriculum, make use of video-feedback, and are short term (Bakermans-Kranenburg et al., 2003). The VIPP-SD satisfies these criteria, and has already shown positive effects on parental attitudes and sensitivity in various settings (see Juffer et al., 2008). In the current study, the intervention program VIPP-SD, is minimally adapted for home-based childcare, and tested with home-based caregivers. This study is unique in its kind, because (1) we make use of individualized video-feedback (instead of a video model), (2) we observe childcare quality and caregiver sensitivity (besides reported caregiver attitudes), and (3) conduct a randomized controlled trial. We expect the intervention program to be effective in (1) enhancing global childcare quality and caregiver sensitivity, and (2) positively changing caregiver attitude towards sensitive caregiving and limit setting. In addition, we evaluate caregiver satisfaction with the program.

METHOD

Participants and randomization

Participants in this randomized, controlled, parallel-group study were recruited from 23 home-based child care organizations in the western region of the Netherlands. Inclusion criteria were: (1) caregivers took care of at least two children under the age of four, (2) caregivers were not biologically related to these children, and (3) caregiving took place in their own home. Caregivers were approached for participation, and registration for the study was closed after agreement to participate from 120 caregivers. The flow chart (see Figure 5.1) shows participant progress through the phases of the randomized trial, which lasted for six months including selection (baseline), pretest assessment, intervention (or control condition), and posttest assessment. All measurements and the intervention took place at caregivers' homes during childcare.

In September 2008, all caregivers were invited for the baseline visit. Seventeen caregivers were not eligible for the study, because inclusion criteria were not met. All other 103 caregivers were visited between November 2008 and January 2009 by an observer who measured caregiver sensitivity using the Caregiver Interaction Scale (CIS, Arnett, 1989). Based on our pilot study we anticipated that some caregivers would not be willing to participate in the study after all (e.g., because of changes in the childcare arrangement, such as children leaving). In anticipation of this expected refusal rate, we included an extra group of caregivers. After the baseline visit, 66 caregivers, scoring the lowest on sensitivity (CIS subscale 'sensitivity' mean score ≤ 3), were randomly assigned to either the intervention group ($n = 25$), the control group ($n = 25$), or the extra group ($n = 16$). Because of availability of interveners, the number of participants in the intervention group and the control group was restricted to 25. Mean CIS scores between these three groups did not differ ($F(2, 63) = 0.43, p = .65$). Following simple randomization procedures (random numbers), participants were randomly assigned to one of these three groups by the first author. Caregivers scoring high on sensitivity ($n = 37$; 'high sensitivity group') served as non-experimental comparison group only (see demographic information in Table 5.1).

Table 5.1

Demographics of intervention group, control group, and high sensitivity group

	Intervention group ($n = 24$)		Control group ($n = 24$)		High sensitivity group ($n = 37$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	43.30	9.23	40.36	8.80	44.07	6.58
Education	12.57	1.80	11.86	2.10	12.45	1.97
Hours/ week working	34.74	9.36	37.55	9.69	38.20	12.01
<i>N</i> children in childcare	6.82	3.92	6.91	3.85	6.52	3.32

The fifty caregivers in the intervention group and the control group received a letter revealing whether they were assigned to the 'training' (intervention) or

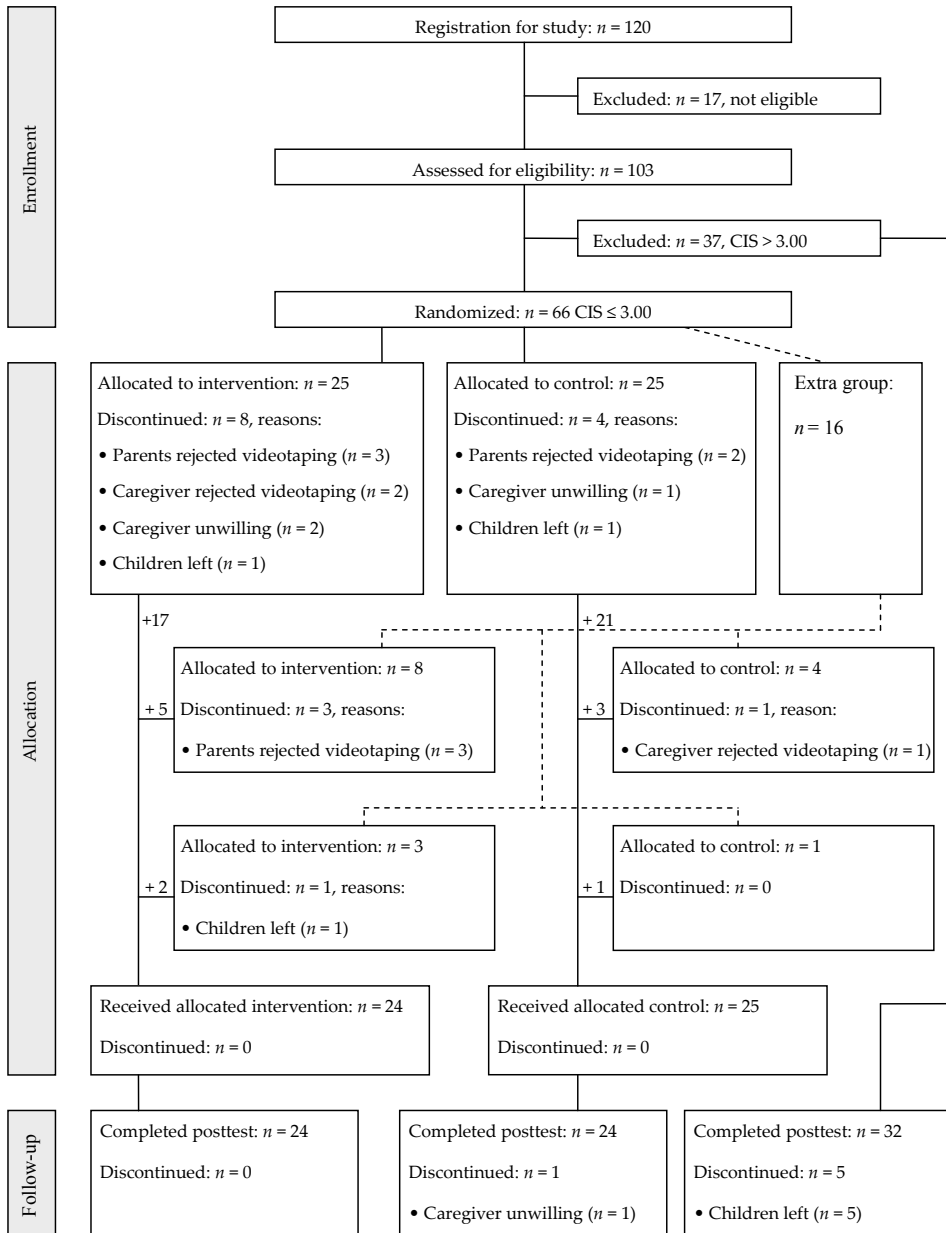


Figure 5.1 Flow chart

the 'telephone' (control) group. Eight caregivers in the intervention group and four caregivers in the control group refused to participate. Caregivers from the extra group –scoring as low on caregiver sensitivity as the intervention and the control group– were randomly assigned to the intervention ($n = 8$) or the control group ($n = 4$). Of these caregivers, again four caregivers relinquished from the study, and caregivers from the extra group were again randomly assigned to the intervention ($n = 3$) or the control group ($n = 1$). Of this group, only one caregiver (in the intervention group) discontinued because all the children she was taking care of had left. The total number of caregivers who relinquished from the study ($n = 17$) did not differ on caregiver sensitivity from caregivers who remained in the study ($t(63) = -1.66, p = .11$). In addition, caregivers who relinquished from the intervention group ($n = 12$) did not differ on caregiver sensitivity from caregivers who relinquished from the control group ($n = 5$) ($t(15) = -0.34, p = .74$). The allocation phase resulted in two groups of caregivers: 24 caregivers in the intervention group and 25 caregivers in the control group.

All 49 caregivers received a pretest home visit. The posttest took place in May – July 2009, after which the trial was ended. One of the caregivers in the control group did not complete the posttest because she cancelled all appointments. This caregiver's scores on all measures, both during baseline and pretest, did not differ from the other caregivers' mean scores in the control group. To control for the effect of removing this caregiver from the study, we ran duplicates of all analyses: We found no differences in outcomes after imputing missing scores in the posttest (with the mean of the control group) or after (multiple) random deletion of one caregiver from the intervention group. The final sample included 48 participants: 24 caregivers in the intervention group and 24 caregivers in the control group.

The non-experimental comparison group ('high sensitivity group'; $n = 37$) received a posttest only. Five caregivers in this group did not complete the posttest, because they no longer took care of children under the age of four. Demographic information of the intervention group, control group, and 'high sensitivity' group is summarized in Table 5.1. Caregivers' age, education, number of working hours per week, and the number of children they were taking care of in childcare did not differ significantly.

Procedure

The procedure within this study meets with the CONSORT criteria. All procedures were carried out with the adequate understanding and written consent of caregivers and parents. Ethical approval for this study was provided by the Leiden Institute of Education and Child Studies. During baseline, each setting was visited by an observer who spent a morning in the childcare homes to administer the CIS and the Infant Toddler Child Care Home Observation for Measurement of the Environment inventory (IT-CC-HOME; Caldwell & Bradley, 2003). After the baseline visit, caregivers scoring low on sensitivity (CIS ≤ 3) were randomly assigned to either the control or the intervention group. All 48 caregivers received a pretest visit, in which the observer videotaped three 10-minute episodes of regular childcare activities at predetermined time points and two structured play episodes of each five minutes.

Caregivers in the intervention group received six home visits and, parallel in timing, caregivers in the control group received six telephone calls. Post-test visits took place approximately six months after baseline ($M = 5.92$, $SD = 1.14$). Again, the IT-CC-HOME was administered and the three 10-minute episodes and two structured play situations were videotaped. For the high sensitivity group, only the IT-CC-HOME was administered. All videotaped episodes were rated afterwards on caregiver sensitivity by coders who were unaware of the experimental condition and who met the criteria to reliably assess these scales. To obtain independency in ratings, observers who visited the childcare setting did not rate caregiver sensitivity in this specific setting, and coders who rated the pretest caregiver fragments did not rate the fragments from the posttest, and vice versa. For the same reason, observers visited a specific childcare setting only once.

Intervention program

VIPP-SD. The Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPPSD, Juffer et al., 2008) was adapted for implementation in home-based childcare: the Video-feedback Intervention to promote Positive Parenting: ChildCare (VIPPS-CC). The intervention trajectory is divided into three phases, which all consist of two sessions. In the first phase, interveners try to build a relationship with the caregiver with an emphasis in their video-feedback on child behavior. The themes of the first two sessions are (1) exploration versus contact seeking, (2) 'speaking for the child'. The second phase focuses at improving caregiver behavior by showing at what moments strategies work. The themes of the two sessions in this phase focus on (3) sensitivity, how and when to use a sensitive time-out, and (4) empathy. The third phase consists of two booster sessions in which all feedback and information is reviewed. At the end of the intervention program, caregivers receive a brochure with information on key issues discussed during the home visits.

VIPP-CC. To implement the original VIPPS-SD to childcare, we adapted the program for caregivers taking care of a group of children by slightly modifying the procedure and materials of the home visits, as the situation in home-based childcare differs from the home situation (e.g. more than one child present, professional childcare). In the VIPPS-SD, interveners first videotaped a structured play session (for about half an hour) and then subsequently discussed the videotaped episodes from the last visit (for about an hour). In the VIPPS-CC, interveners first videotaped the structured play session and then left the home, allowing caregivers and children to have a quiet lunch. After the caregivers put (some of) the children into bed, interveners returned and discussed the videotaped episodes from the last visit. Furthermore, the 'speaking for the child' was not only directed to one child at a time, but also to the entire group of children ('speaking for the children'), emphasizing caregivers' attention for the signals of all children present. In addition, the toys that were used during structured play situations were adapted for a group setting, for example by using a big box of Duplo bricks and large story books. A pilot study with eight caregivers (from whom five received the intervention program and three the control condition) showed the feasibility of the VIPPS-CC approach in the context of group care.

Interveners were graduate students ($n = 7$), who were first trained on the VIPP-SD during a full-time week workshop by one of the VIPP-SD experts from the Centre of Child and Family Studies, including home assignments which were provided with feedback from the VIPP-SD expert. After this training, interveners received further training on the adapted VIPP-CC. During the intervention period, four feedback sessions were held, in which structured play situations and scripts were discussed, as well as how to build and obtain a professional relationship with the caregiver.

Control group

In order to keep in contact with all caregivers and to prevent attrition, caregivers in the control group received a dummy intervention (Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2005a). Parallel to the intervention sessions, caregivers in the control group received six telephone calls. During these semi-structured interviews, caregivers were invited to talk about general developmental topics (e.g. eating, talking, playing). This control group received no advice or information about sensitivity or child development.

Measures

Selection. For selection purposes, caregiver sensitivity in the group setting was examined by direct observation using the Caregiver Interaction Scale (CIS, Arnett, 1989). The CIS consists of 26 items; for each item a score is given from 1 (not applicable) to 4 (very applicable). In a Dutch study (Van IJzendoorn, Tavecchio, Verhoeven, Reiling, & Stams, 1996), two dimensions were found: sensitivity (14 items) and authoritarian caregiving (12 items). In the study reported here, the subscale 'sensitivity' was used, because of its close link with the aim of the intervention. Internal consistency (Cronbach's alpha) of this scale was .84. Mean intra-class correlations of the observers (two-way mixed, absolute agreement) was .80 (range .78 to .84).

Caregiving attitude. Two weeks after the posttest, caregivers were sent a questionnaire regarding their attitude towards sensitive caregiving and limit setting (Bakermans-Kranenburg & Van IJzendoorn, 2003). They were asked to indicate their attitudes on 17 items, ranging from (1) totally disagree to (5) totally agree. Examples of items are 'In my opinion, I should praise my children in childcare at least once a day' and 'My children in childcare must learn that I will get angry when they do not listen to me' (reversed). Cronbach's alpha was .64.

Global quality of childcare. The IT-CC-HOME (Caldwell & Bradley, 2003) is designed to measure the quality and quantity of stimulation and support available to a child in the childcare home environment, and covers various domains of childcare: responsivity, acceptance, organization, learning materials, involvement, and variation. A positive (1) or a negative (0) score is achieved for each of the 43 items. Two items were deleted from the scale: item 21 'Child gets out of house at least four times a week' and item 42 'Caregiver and child visit or receive visits from neighbor or friends once a month or so'. These items were not applicable to the Dutch situation, because in the Netherlands children visit home-based childcare on average two or three days a week, in contrast to

other countries (Statistics Netherlands, 2008b). The total IT-CC-HOME score is a summation across the 41 item scores (0 or 1). Internal consistency (Cronbach's alpha) of this scale was .60. Here, we do not report on data at the sub-scale level, because of low internal consistencies (range Cronbach's alpha's from .12 to .48). Ten observers were trained prior to the study. After a general introduction, observers visited at least four caregivers in pairs to complete the IT-CC-HOME. Each observation was followed by an item-by-item debriefing with the trainer. Interrater reliability was established to a criterion of 80% agreement.

Caregiver sensitivity. During pretest and posttest, three unstructured episodes of each ten minutes and two structured play episodes of each five minutes were videotaped to code caregiver sensitivity. Both structured situations consisted of ten minutes play with Duplo bricks or a car rollercoaster. Coding of videotaped episodes took place by means of a scale developed and validated by the Dutch Consortium for Child Care Research (NCKO; De Kruif et al., 2007). This group rating scale is based on scales developed to measure sensitivity in a parent-child context (Ainsworth, Bell, & Stayton, 1974; Erickson, Sroufe, & Egeland, 1985). Sensitivity ratings are presented on a seven-point scale, ranging from (1) very low sensitivity to (7) very high sensitivity. Five observers were trained and became reliable on the same dataset to assess caregivers' sensitivity. Mean intra-class correlations (two-way mixed, absolute agreement) was .73 (range .69 to .75). Internal consistency of this scale was .74 (pretest) and .83 (posttest). During data collection, sensitivity of ten caregivers was doubly coded, resulting in an intra-class correlation of .95.

Caregiver feedback. Two weeks after the posttest, we sent caregivers a questionnaire to evaluate the intervention regarding several topics, e.g. usefulness, number of sessions, the video-feedback, and the contact with the intervener.

Data analysis

To test whether changes in global quality of childcare and observed caregiver sensitivity occurred, repeated measures ANOVA's were conducted controlling for the baseline (global quality) or the pretest (observed sensitivity) measures. An independent *t*-test was used to compare caregiver attitude between the control group and the intervention group.

RESULTS

Descriptives

During the posttest, a significant association was present between global quality and observed sensitivity ($r = .35, p < .05$). No associations were found between caregiving attitudes and global quality ($r = .20, p = .17$) or observed sensitivity ($r = -.18, p = .22$). For the intervention group, a significant association was present between global quality during baseline and observed sensitivity during the posttest ($r = .55, p < .01$), and between observed sensitivity during the pretest and global quality during posttest ($r = .50, p < .01$). In the control group, global quality during baseline and posttest were significantly associated ($r = .56, p < .01$). Also, observed sensitivity during pretest and posttest were associated ($r = .43,$

$p < .05$). For the high sensitivity group, there was a significant association between the two measurements during baseline and posttest: $r = .40$, $p < .05$. Descriptive statistics of the pretest, baseline, and posttest measures are shown in Table 5.2.

Table 5.2

Descriptive statistics for intervention group, control group, and high sensitivity group during baseline/ pretest and posttest

	Intervention			Control			High sensitivity			Difference ¹	
	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>t-/F-value</i>	<i>p</i>
Baseline/ pretest											
Global quality	34.46 ^a	2.52	0.51	35.21 ^a	2.43	0.50	37.32 ^b	2.01	0.33	13.07	.00
Observed sensitivity	4.60	0.83	0.17	4.98	0.66	0.13				-1.75	.09
Posttest											
Global quality	35.92	3.05	0.62	34.75	3.44	0.70	35.91	1.78	0.32	1.49	<.01
Observed sensitivity	4.53	0.81	0.17	4.75	0.86	0.18				-0.91	.37
Caregiving attitudes	3.97	0.41	0.08	3.69	0.42	0.08				2.29	.03

^a and ^b differ significantly.

*Note*¹. Statistics for global quality are *F*-values. Statistics for observed sensitivity and caregiving attitudes are *t*-values.

Caregiving attitude

After the intervention, caregivers who received the intervention reported a more positive attitude towards caregiving and limit setting ($M = 3.97$, $SD = 0.41$, $SE = 0.09$) than caregivers in the control group ($M = 3.69$, $SD = 0.42$, $SE = 0.08$); $t(46) = 2.29$, $p < .05$, $CFI = 0.03-0.52$ $d = 0.69$).

Global quality

To test whether the intervention resulted in changes in global quality, repeated measures ANOVA's were conducted on the IT-CC-HOME. No main effects were present for time (*Pillais F* (1, 46) = 1.30, $p = .26$, *partial* $\eta^2 = .03$) or group (*Pillais F* (1, 46) = 0.09, $p = .77$, *partial* $\eta^2 < .00$), but a significant interaction effect was found (*Pillais F* (1, 46) = 4.76, $p < .05$, *partial* $\eta^2 = .09$). This interaction is shown in Figure 5.2: Global quality significantly increased in the intervention group, but not in the control group.

After including the scores of the high sensitivity group into the repeated measures analysis, there was still no main effect for time (*Pillais F* (1, 77) = 0.58, $p = .45$, *partial* $\eta^2 = .01$), but a significant main effect for group emerged (*Pillais F* (1, 77) = 5.94, $p < .01$, *partial* $\eta^2 = .13$), as well as a significant interaction effect (*Pillais F* (1, 77) = 9.54, $p < .01$, *partial* $\eta^2 = .20$). At baseline, global quality was higher in the high sensitivity group compared to the intervention group and control group. Furthermore, global quality declined in the high sensitivity group and in the control group, whereas it increased in the intervention group.

Observed caregiver sensitivity

No significant main effects of time (*Pillais F* (1, 46) = 1.54, $p = .22$, *partial* $\eta^2 = .03$) or group (*Pillais F* (1, 46) = 2.42, $p = .13$, *partial* $\eta^2 = .05$) were present for observed caregiver sensitivity. Also, no interaction effect (*Pillais F* (1, 46) = 0.39, $p = .54$, *partial* $\eta^2 = .01$) emerged.

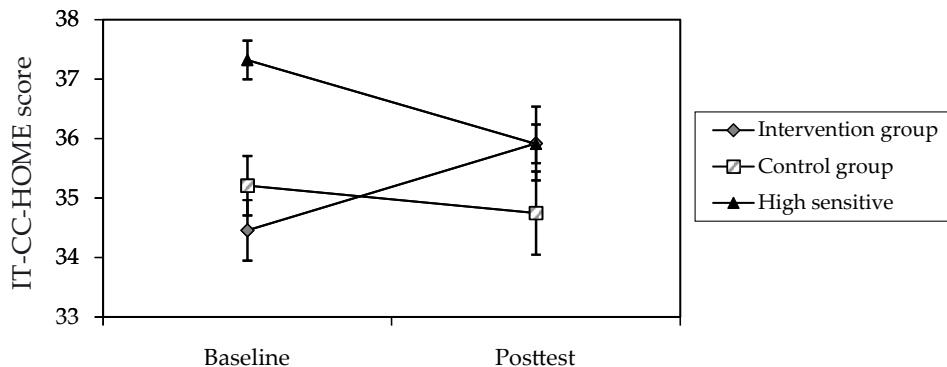


Figure 5.2 Global quality in the intervention group (n = 24), the control group (n = 24), and the high sensitivity group (n = 32) during baseline and posttest

Caregiver feedback

Almost all caregivers reported that the VIPP-CC was useful (18/24) or very useful (4/24). The majority (19/24) of caregivers thought that the number of sessions was adequate. One of the caregivers thought that six sessions were too few (1/24), whereas four caregivers thought these were many (3/24) or too many (1/24). Almost all caregivers experienced the contact with the intervener as pleasant (14/24) or very pleasant (9/24). Only one of them was neutral about the contact with the intervener (1/24). None of the caregivers experienced the visits as interfering. Some caregivers responded they felt tense (9/24) or very tense (1/24) when looking at themselves on video. Nine felt neutral (9/24), and five of them responded they did not feel tense (3/24) or not tense at all (2/24). Finally, most caregivers indicated that they found the intervention not very (12/24) beneficial to their own children (adjusted standardized residual 4.3), but beneficial to the children in childcare (18/24), the caregivers themselves (20/24), and the childcare setting as a whole (21/24) (Table 5.3).

Table 5.3
Caregiver feedback on whether the intervention was beneficial

Beneficial for:	Not very beneficial	Beneficial	Very beneficial	Total
Children in childcare	6 (-0.4)	13 (0.7)	5 (-0.4)	24
Caregiver	4 (-1.5)	13 (0.7)	7 (0.8)	24
Own children ^a	12 (4.3)	3 (-2.8)	2 (-1.3)	17
Childcare setting	3 (-2.0)	14 (1.1)	7 (0.8)	24

^a For seven caregivers this was not applicable, since they did not have (young) children themselves.

Note. Total number (adjusted standardized residuals)

DISCUSSION

Based on the findings of previous intervention studies in families and childcare, the VIPP-SD was selected as an intervention to enhance global quality and caregiver sensitivity in home-based childcare. A randomized controlled design showed that global childcare quality had improved in the intervention group in comparison to the control group. In addition, caregivers in the intervention group showed a more positive attitude towards sensitive caregiving and limit setting than caregivers in the control group. The expected increase in observed sensitivity was not found.

Global quality

Global childcare quality improved significantly through the intervention. The effect size (*partial* η^2) of the interaction was 0.09, which is a medium to large effect size (Kirk, 1996). The children who were visiting caregivers in the intervention group, were in a more stimulating and safe environment after the intervention. This finding is important, because global childcare quality has been found to affect children's cognitive and social development (Peisner-Feinberg et al., 2001; Vandell & Wolfe, 2000).

Bradley, Caldwell, and Corwyn (2003) assessed the quality of childcare homes using data from the NICHD ECCRN (1996). They reported a mean total score of 34.76 ($SD = 5.04$) on the IT-CC-HOME, based on 43 items. This means that in total 81% of the items was scored positively. In our study, 84% of the items were scored positively by caregivers in the intervention group, prior to the intervention. This is comparable to the IT-CC-HOME scores in the NICHD ECCRN study. After the intervention, 88% of the items were scored positively. Our study confirms that the IT-CC-HOME is sensitive to intervention effects, not only in families (for an overview, see Bradley, 1993), but also in home-based childcare.

Caregiver sensitivity

Although after the intervention caregiving attitude towards sensitivity was significantly higher for caregivers in the intervention group than in the control group, there was no significant difference in observed sensitivity. This may be explained by a ceiling effect, due to the relatively high sensitive caregivers in our sample. We selected caregivers who scored a 3 or lower on the CIS (Arnett, 1989). A score of 3 on a 4-point scale however represents a relatively sensitive caregiver. In addition, the absence of an increase in observed sensitivity might be due to the ample child-rearing experience of caregivers in our sample. In the study of Stolk et al. (2008), the use of positive discipline strategies had increased after the VIPP-SD, but only for first-time mothers, and not for multiparas. Because all caregivers in our intervention group already had experience as parents, we were not able to test whether caregivers taking care of a child for the first time benefited more from the intervention than caregivers with child-rearing experience.

Fukkink and Lont (2007) reported in their meta-analysis that experimental results were smaller in the domain of caregiver skills compared to the domain of caregiver attitudes and knowledge. Attitudes seem to be easier to change

than caregiver behavior itself, and attitudinal changes may precede behavioral changes, which may require a longer period of training. However, in the domain of attachment-based family interventions it has been shown that rather brief interventions (less than 16 intervention sessions) were more effective in improving caregiving behavior than long term interventions (Bakermans-Kranenburg, et al., 2003). Taking care of several same-aged children at the same time may be more difficult than interacting with one or two children in the same age-range as is the case in most families. To sensitively divide attention to several different children may therefore require a somewhat longer series of sessions.

In addition, the timing of the posttest may be problematic. Effects of interventions may lie dormant directly after the intervention (sleeper effect), but may become noticeable later on. In our study, the posttest took place two weeks after the last intervention session. Possibly an effect on observed caregiver sensitivity could have been detected if the posttest had taken place later on. The more positive caregiving attitudes might be the first (necessary) step in changing caregiver behavior.

Limitations

The sample size of this study is relatively small, which may have resulted in a lack of statistical power to detect a moderate intervention effect. Also, our small sample size prevented us from comparing subgroups of caregivers. Some caregivers might benefit more from the intervention than others. For example, Klein Velderman et al. (2006) found a larger effect of the VIPP on maternal sensitivity for mothers of highly reactive infants. As already mentioned, another limitation is the relatively high level of sensitivity prior to the intervention which may have caused the ceiling effect. Also, the low variance in observed sensitivity scores may have contributed to not having found significant intervention effects.

In total, 17 caregivers (26%) dropped out after the selection phase, which might have resulted in a selection bias. However, attrition seems unavoidable in intervention studies in childcare even during the intervention phase. For example in the Family-to-Family study, 27% of the caregivers dropped out during the intervention phase (Kontos et al., 1996). In the individualized REACH program, in total 43% of the caregivers dropped out (Espinosa et al., 2009). Although we lost caregivers at the start of the intervention, we were able to retain all caregivers during the complete intervention phase of the study.

Generalizability

As the intervention was implemented in caregivers of different ages with various levels of experience and education in childcare, the results indicate that the entire range of caregivers would benefit from the intervention program. Our experience with implementing the VIPP intervention as well as testing its effectiveness demonstrates that the intervention can be cost-effectively delivered in this childcare setting.

Implications

This study is a first step in adapting and testing the VIPP-SD, originally developed for interventions in families, in childcare. The intervention was effective in enhancing the global quality of childcare homes, a setting that is relatively similar to the home setting. Future studies might focus on adapting the intervention program even further for childcare centers with larger groups of children. A next step will be to study the effects of the VIPP-CC on both caregivers *and* children, in order to study the causal link from intervention through caregiver attitudes and skills to child behavior and development.

Conclusion

The current study revealed that the short term, behaviorally oriented VIPP-CC was effective in enhancing global quality in home-based childcare. Although observed caregiver sensitivity did not increase after the intervention, caregiver attitudes towards sensitive caregiving were higher in the intervention group compared to the control group. This study shows that investing in the improvement of childcare quality through video-feedback interventions is highly valuable for an increasing number of children attending this type of childcare.

