

Development and Aging

Promoting positive parenting practices in primary care: Outcomes and mechanisms of change in a randomized controlled risk reduction trial

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The aim of the present study was to evaluate whether a short parent-training program (PT) reduces risk factors related to development of childhood socio-emotional and behavioral problems in a non-clinical community sample. Data were obtained from parents in a randomized controlled trial (RCT) on PT for children aged 2 to 8 years ($N = 186$) at pre-intervention, post-intervention and one-year-follow up. There were significant differences in the changes in the two groups, with reductions in harsh parenting and child behavior problems, an enhancement of positive parenting and of the parents' sense of competence in the intervention group. The effects on parenting and parents' satisfaction all lasted through one-year follow up. Our findings suggests that a shortened version of a well-structured parenting intervention, The Incredible Years program, implemented in primary care at community level, reduces harsh parenting and strengthens positive parenting and parents' sense of competence, as reported by the parents. Issues related to a public health approach to promote positive parenting are discussed.

Key words: Positive parenting, health promotion, risk reduction, socio-emotional, behavioral problems.

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INTRODUCTION

Socio-emotional and behavioral problems are common in young children (Campbell, 1995; Costello, Egger & Angold, 2005). It is important to prevent the development of socio-emotional and behavioral problems in young children, since early onset tends to predict more severe, long-lasting problems and a poorer outcome for the child (Loeber, Burke, Lahey, Winters & Zera, 2000).

Parenting behaviors influence the development of socio-emotional and behavioral problems in children (Hutchings & Lane, 2005), and the context of dysfunctional family interactions, such as harsh and inconsistent parenting styles, are significant risk factors for child maltreatment and a variety of other undesirable outcomes related to children's socio-emotional and behavioral development (Bauer & Webster-Stratton, 2006; Foster, Prinz, Sanders & Shapiro, 2008; Gardner, Sonuga-Barke & Sayal, 1999; Granic & Patterson, 2006). The quality of parenting a child receives is considered to be the most potent but also the most modifiable risk factor contributing to the development of behavioral and emotional problems in children (Morawska, Winter & Sanders, 2009). A number of empirical articles published in the course of the past decade also emphasize that parenting programs are among the most powerful and cost-effective interventions available to prevent child maltreatment and socio-emotional and behavioral problems in children (Foster *et al.*, 2008; Sanders, Calam, Durand, Liversidge & Carmont, 2008). The most effective parenting programs available are those based on social learning principles (Sanders, Turner & Markie-Dadds, 2002), and these programs highlight the role of parents as children's interactive partners, instructors and providers of social activities and opportunities. However, most parent-training programs are delivered in the form of treatments of oppositional defiant and conduct problems, or as preventive interventions for high-risk children with

some symptoms of behavioral disorders. In spite of the demonstrated efficacy of such programs, these are not available to many families, and some children go on to develop socio-emotional and behavioral problems which might otherwise have been prevented (Foster *et al.*, 2008). Reaching the population is regarded as a major challenge, and the answer provided by researchers has been to develop a public-health approach to increase the impact of parenting interventions at population level (Saxena, Jané-Llopis & Hosman, 2006). There is strong evidence that preventive interventions can result in a reduction of risk as well as the reinforcement of protective factors related to the initial onset of mental health problems. Researchers have suggested that a useful approach for preventive interventions is one that focuses on groups of risks and protective factors. Within this framework, a positive result of different preventive interventions would be a reduction in the risk factors associated with a specific outcome, rather than a reduction of the outcome itself. Furthermore, it has been suggested that the effect of preventive interventions is likely to be a reduction in risk factors among those at greatest risk, while the effect of the same intervention for those at lower risk may be to strengthen protective factors (Saxena *et al.*, 2006).

A substantial body of research illustrates that a parenting style providing the child with positive non-disciplinary interactions, enthusiastic play where the adult follows the interest of the child, provides positive attention, and a responsive, sensitive and nurturing environment; all this contributes to promoting good mental health in children and preventing the development of socio-emotional and behavioral problems (Biglan, 1995; DeRosier & Gilliom, 2007; Gardner *et al.*, 1999; Hutchings & Lane, 2005; Webster-Stratton & Reid, 2003b). However, universal prevention approaches that seek to improve parental competencies among children at community level are not common, and only a small number of studies have examined the impact of parenting

programs as a public-health approach to parenting support (Sanders *et al.*, 2008). One example of a comprehensive public-health approach is the Triple P – Positive Parenting Program (Foster *et al.*, 2008), which aims to prevent severe behavioral, emotional and developmental problems in children by strengthening the knowledge, skills and confidence of parents (Joachim, Sanders & Turner, 2010). Research on the Triple P series shows that parents who manage to change problematic parenting practices have children who develop fewer problems, both within the family, among their peers, and at school (Sanders *et al.*, 2002). The parents also had more positive attitudes towards their children, were more confident in their role as parents, and were less stressed by the parenting role. Recently, Sanders and colleagues reported that a public health approach supporting parenting by having parents watch a six-session Triple P series broadcast by the television network improved their child's behavior and their own parenting practices after parents had viewed the series (Sanders *et al.*, 2008). However, a large proportion of the participating parents had children with behavior problems (defined by scores on the Eyberg Child Behavior Inventory in the clinical range), and the total prevention effect may be made by an overall treatment effect for the children in clinical range.

Another example of an evidence-based parenting intervention is the Incredible Years (IY) program for 3- to 8-year-old children with disruptive behavior problems (Webster-Stratton & Reid, 2003a). The content of this program is based on a relational framework in which parents improve their parenting skills through practice with their child, paralleled by role play and discussion in groups of parents. In the course of the past 20 years, the efficacy of the IY program has been systematically evaluated and has shown positive treatment and preventive effects in the US, in a series of studies of both clinical and high-risk-community samples (Gardner, Burton & Klimes, 2006; Webster-Stratton, 1998; Webster-Stratton, Reid & Hammond, 2001), and in independent replications in other countries (Gardner *et al.*, 2006; Scott, Spender, Dooland, Jacobs & Aspland, 2001; Taylor, Schmidt, Pepler & Hodgins, 1998). Recently, this program has shown positive results in an uncontrolled Swedish study (Axberg, Hansson & Broberg, 2007) and a Norwegian RCT replication study (Larsson, Fossum, Clifford, Drugli, Handegård & Mørch, 2009). The results of the Norwegian study showed positive changes in parenting skills, ranging from moderate to large effects, i.e. mothers were less harsh in their disciplining, and more positive in their parenting practices after parent-training. The IY Basic parenting program has been implemented throughout Norway, and has also become the intervention of choice in the prevention and treatment of moderate to severe behavioral problems in very young children in parts of Sweden and Denmark.

In a study by Baydar and her colleagues (Baydar, Reid & Webster-Stratton, 2003) the results indicated that mothers participating in the IY Basic program benefitted after only three sessions, and that their positive parenting changes continued to increase throughout the program. Little is known about the effectiveness of preventive parenting programs offered to non-referred parents whose children have not been diagnosed with socio-emotional and behavior problems. The present study extends the literature on universal prevention of socio-emotional and behavioral problems by exploring whether a shortened version of the IY program

is capable of reducing important risk factors and strengthening central resilience factors related to behavioral problems in a non-clinical community sample. To our knowledge the IY program has never been evaluated in a short format or utilized in a normal population of children. We hypothesized that the intervention would affect the parents' level of positive and harsh parenting, resulting in a more positive parenting style and a reduction in punitive and harsh parenting. Second, we expected the intervention to improve parents' experience of their own competence, such that they would be more satisfied and efficacious in their role as parents. Issues related to a public health approach to promote positive parenting are discussed.

METHOD

Participants

A total of 269 families volunteered to participate in the study. A total of 58 children (22%) were excluded from the study due to ECBI Intensity scores above the 90th percentile. This procedure was adopted for ethical reasons, and families excluded from the intervention study were offered the full 12- to 14-week Basic IY program. Of the remaining 211 families, 22 families (10%) terminated their participation during the initial phase of the study. The parents of 189 children between 2 and 8 years of age thus completed participation in the study.

The children were 112 boys (59%), and 77 girls (41%). The mean age of the boys was 3.95 years ($SD = 1.63$), and of the girls 3.81 years ($SD = 1.13$). Both the mother and father responded in 112 cases (59%), only the mother in 74 cases (39%), and only the father in 3 cases (2%). The term "parents" will be used even though the analyses are based on mothers' responses ($n = 186$). Each family who made contact and who fulfilled the inclusion criteria, was assigned an id number, and was randomized to either intervention ($n = 89$), or control group ($n = 97$). Randomization numbers were generated in SPSS.

Parents in this sample worked full time (61%), were two-parent families (80%), and were educated to bachelor level or higher (78%) (Reedtz, Martinussen, Jørgensen, Handegård & Mørch, 2010). The mean age of the children was less than four years, and their Intensity scores on ECBI were higher than the Norwegian mean scores for their age group (Reedtz, Bertelsen, Lurie, Handegård, Clifford & Mørch, 2008). Measures of child behavior resulted in an average ECBI Intensity score of 103.3 ($SD = 16.7$). The norm for Norwegian children between 4 and 8 years old on the ECBI Intensity scores is 93.0 ($SD = 23.6$). The difference between the Norwegian norm and the scores in our sample is significant (Intensity: $t = 7.7$, $p < 0.001$; Problem: $t = 7.1$, $p < 0.001$).

In order to determine the extent to which the sample in the study ($N = 186$) differed from the 22 families who terminated their participation, we compared the two samples on all variables measured in the study. The two groups were similar with regards to both demographic information and their scores on the selected measures. Differences in child age, parental employment status, parental level of education, marital status, number of siblings in the home, and child birth order were also non-significant.

Several parents failed to complete the questionnaires at post-intervention and one year follow-up. At post-intervention, 24.7% failed to complete the questionnaires in the intervention group, while 46.4% failed to complete them in the control group. Also at one year follow-up, 24.7% failed to complete the questionnaires in the intervention group, and 52.6% failed to complete them in the control group. In order to test whether the non-completers in the two groups differed from the participants in the project, we performed two-way ANOVAs for continuous variables (maternal age, parental sense of competence, child behaviour, and parenting practices), logistic regressions for dichotomous variables and ordinal regressions for ordinal variables (education, employment status, marital status, child gender). We found no significant interactions between non-completer status and participating group status on any of

the targeted variables. Nor were there any main effects of the status of non-completers of the questionnaires and that of participants. This indicates that the scores on all variables at pre-measurement did not relate to whether subjects failed to complete or participated in the project. We assume that a large proportion of the non-completion of questionnaires in the control group was due to the fact that parents in the control condition did not benefit in any way from participation, so they were not motivated to continually fill out questionnaires.

Measures

The questionnaire consisted of three different assessment instruments in addition to questions about the child's gender, age, how many children the parents have, the child's birth order, and parents' age, marital status, employment status, education, and information about who completed the questionnaire.

Eyberg Child Behavior Inventory (ECBI; Robinson, Eyberg & Ross, 1980). The ECBI provides a list of 36 problem behaviors frequently reported by parents of children with behavior problems. The inventory assesses behavior on two dimensions; the frequency of the behavior and its identification as a problem. The frequency ratings range from 1 (never) to 7 (always), and were summed to yield an overall problem behavior Intensity score (Cronbach's $\alpha = 0.82$) ranging from 36 to 252.

Parenting Sense of Competence (PSOC; Johnston & Mash, 1989). The PSOC consists of 16 items answered on a six-point scale ranging from "strongly disagree" to "strongly agree". Scoring for some items is reversed so that, for all items, higher scores indicate greater parenting self-esteem. Two subscales measure efficacy (7 items, $\alpha = 0.69$) and satisfaction (9 items, $\alpha = 0.77$) in parenting, and are computed by summing the scores within each scale.

Parenting Practices Interview (PPI; Webster-Stratton et al., 2001). The PPI was adapted from the Oregon Social Learning Centre's Discipline Questionnaire. Two subscales were used; Harsh Discipline (14 items, $\alpha = 0.79$), and Positive Parenting (15 items, $\alpha = 0.67$). Parents reported the probability and the frequency with which they used the different strategies on a seven-point scale, and mean scores were computed on each scale.

Procedure

Families who had a 2- to 8-year-old child were recruited from the city of Tromsø (where about 900 children are born every year) through posters in kindergartens and schools, advertisements in newspapers, and invitations sent by postal mail. When a family contacted the service provider, a project coordinator briefly explained the study and mailed an information letter to the parents. Both mothers and fathers were asked to complete the questionnaires they received independently and to return the forms and a signed letter of informed consent in a pre-paid envelope. If there was more than one child between 2 and 8 years of age in the household, the youngest was selected as the target child in the study in order to ensure data independency. The study was approved by the Regional Committee for Ethics in Medical Research, at the University of Tromsø.

Design. A randomized experimental control between-group design was used with pre- and post-intervention measurements, and at one-year follow-up. Children and families were randomized to either the shortened Basic version ($n = 89$), or the control group ($n = 97$). Families assigned to the control condition did not receive any intervention from the research project, but completed the questionnaires at the same time as the intervention groups.

Intervention. The IY intervention program developed by Webster-Stratton at the Parenting Clinic, University of Washington, is a manualized and

video-based training program for parents of young children with conduct problems (Webster-Stratton & Reid, 2003a). Parents assigned to the short Basic IY (S-IY) condition were divided into groups of 10–12 parents. The S-IY was led by two experienced group leaders and parents met weekly for two-hour sessions at a public-health care center. The group leaders led discussions regarding central aspects of parenting on the basis of the video vignettes, role plays and homework. The program taught parents positive disciplinary strategies (play, praise and rewards) and the original manual was followed for the six first sessions of the Basic IY program. The S-IY intervention differs from the regular Basic IY intervention in both length (six versus twelve parent sessions), and content (regular Basic IY also covers effective limit setting, ignoring negative behaviors and timeout).

Group leaders. Altogether 15 group leaders administered the S-IY. Each group leader was a trained nurse specializing in public health care, and had experience in clinical work. The group leaders were trained according to certification procedures established by the Incredible Years program, and received continuous supervision through observations, role play, and video reviews from a certified trainer and two mentors.

Intervention integrity. The therapists followed the treatment manual, completed standard check-lists after each session, and tracked group activities (number of vignettes shown, role-plays, and parent home-tasks). All parent sessions were videotaped for evaluation by a mentor, and selected tapes were reviewed at weekly peer and self-evaluation meetings. Data obtained from checklists and videotapes were not analyzed as part of this study.

Statistics

All statistical analyses used SPSS (version 15). Group comparisons on demographic variables were made with ANOVA or Chi-square tests, depending on whether the variables were continuous or categorical.

We wished to test three specific questions about group differences over time: (1) Are there any group differences in change from pre- to post-intervention? (2) Are there any group differences in change from pre-intervention to follow-up? (3) Are there any group differences in change from post-intervention to follow-up? Rausch, Maxwell, and Kelley (2003) argue that these specific questions should be analyzed using ANCOVA, controlling for the pre-score in all analyses to maximize power. We therefore used ANCOVA, using the pre-score as covariate in all analyses (Rausch et al., 2003). In order for the ANCOVA to be valid, there should be no treatment group differences on pre-intervention measures. In order to test whether the intervention group and the control group were different at pre-intervention measures, we used a one-way ANOVA. Effect sizes were calculated using partial eta square (η^2) (Cohen, 1988). Cohen denotes a typical small effect to be around $\eta^2 = 0.01$, a typical medium effect to be approximately $\eta^2 = 0.06$, and a large effect to be about $\eta^2 = 0.14$.

Missing data at subject level were imputed using a method described by Bingham and colleagues (Bingham, Stemmler, Petersen & Graber, 1998). These imputation procedures impute new values on the basis of each individual's observed values and the mean value for the missing time point(s). Bingham's method conserves the sample mean and the between-case variance for the variables being assessed.

RESULTS

Differences in pre-intervention measures

The one-way ANOVA showed that there are no significant differences between the intervention and control group in scores on child behavior, parenting and parent's sense of competence. The lowest p -value was 0.32.

Group differences in change from pre-intervention to post-intervention

Group differences in change in parenting. The ANCOVA showed that the two groups changed significantly from pre- to post-intervention on PPI – Positive Parenting. The mean scores and tests for group differences with effect sizes are presented in Table 1. The intervention group showed a larger positive change than the control group. The two groups also changed significantly on PPI – Harsh Discipline, and the intervention group showed a larger drop in harsh discipline than the control group.

Group differences in change on parent characteristics. The two groups changed significantly from pre- to post-intervention on PSOC – Satisfaction. The intervention group showed a larger change in satisfaction than the control group. The two groups also changed significantly on PSOC – Efficacy, and the intervention group showed larger efficacy change than the control group.

Group differences in change on child behavior. The two groups changed significantly from pre- to post on ECBI – Intensity, as the intervention group showed a larger reduction of behavior problems change from pre to post than the control group.

Group differences in change from pre-intervention to follow-up

Group differences in change on parenting. The two groups were significantly different from pre-intervention to one-year follow-up on PPI – Positive Parenting. The intervention group showed a larger positive change than the control group. The two groups also changed significantly on PPI – Harsh Discipline, and the intervention group showed a larger drop in Harsh Discipline than the control group. The changes are shown in Fig. 1.

Group differences in change on parent characteristics. The two groups changed significantly from pre-intervention to one-year follow-up on PSOC – Satisfaction. The intervention group showed a larger change in Satisfaction than the control group. The difference in change on PSOC – Efficacy between the two groups faded out and was no longer present at one-year follow-up.

Group differences in change on child behavior. The reduction in behavior problems in the intervention groups from pre- to

post-intervention faded out and the difference between the intervention and control groups was no longer present at one-year follow-up.

Group differences in change from post-intervention to follow-up

In order to test whether the magnitude of the intervention effects are the same at the post-intervention and the follow-up an ANCOVA was performed on the difference score covarying the pre-intervention (Rausch *et al.*, 2003).

Group differences in change on parenting. The two groups were significantly different from post test to one-year follow-up on PPI – Positive Parenting. They were still different, but more similar than at post-intervention. Since there was a significant difference in change between the groups at one-year follow-up, adjusted for pre-intervention measures, we can still infer that the intervention group showed more positive parenting than the control group at one-year follow-up. The two groups did not change significantly from post test to one-year follow-up on PPI – Harsh Discipline. Hence, the intervention group still showed a larger drop in Harsh Discipline than the control group at one-year follow-up.

Group differences in change on parent characteristics. The two groups did not change significantly from post-intervention to one-year follow-up on PSOC – Satisfaction. The intervention group thus showed higher satisfaction than the control group at one year follow-up.

DISCUSSION

This study examined the risk-reduction effects of a shortened version of the Basic IY program, using a randomized controlled trial including 186 children aged 2–8 years. Families were self-recruited from a general population. The results showed significant differences in changes in the two groups, regarding reductions in harsh parenting (moderate to large effects) and children's behavioral problems (small effects), and a strengthening of positive parenting (large effects) and parents' sense of competence (small effects). The difference in child behavior and parents' sense of efficacy were present at post-intervention, but not at one-year follow-up, whereas the effects regarding parenting and parents' sense of satisfaction all lasted through one-year follow up.

Table 1. *Group differences from pre- to post-test, and one year follow up.*

| Dimension | Intervention (n = 89) | | | Control (n = 97) | | | Intervention vs. Control | | |
|------------------------|-----------------------|-------------|-------------|------------------|--------------|-------------|---|--|---|
| | Pre | Post | Follow-up | Pre | Post | Follow-up | F _{1, 183} (η ²) Pre-post | F _{1, 183} (η ²) Pre-follow up | F _{1, 183} (η ²) Post-follow up |
| ECBI intensity | 104.2 (18.6) | 98.2 (17.6) | 98.1 (19.8) | 102.0 (14.4) | 100.2 (17.4) | 98.2 (16.5) | 4.0* (0.02) | 0.8 (0.004) | 1.6 (0.01) |
| PPI harsh discipline | 1.96 (0.47) | 1.71 (0.40) | 1.76 (0.40) | 1.93 (0.38) | 1.87 (0.42) | 1.86 (0.39) | 18.3*** (0.09) | 9.9** (0.05) | 2.4 (0.01) |
| PPI positive parenting | 4.56 (0.49) | 5.13 (0.52) | 5.05 (0.47) | 4.49 (0.57) | 4.67 (0.58) | 4.75 (0.53) | 45.9*** (0.20) | 24.8*** (0.12) | 9.2** (0.05) |
| PSOC satisfaction | 39.4 (6.6) | 42.6 (6.1) | 43.0 (5.6) | 40.1 (6.0) | 41.7 (6.5) | 42.5 (6.4) | 7.8** (0.04) | 4.1* (0.02) | 0.6 (0.003) |
| PSOC efficacy | 31.4 (3.6) | 33.6 (3.6) | 33.8 (3.6) | 31.8 (3.8) | 32.9 (3.9) | 33.6 (3.9) | 9.9** (0.05) | 2.4 (0.01) | 3.1 (0.02) |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

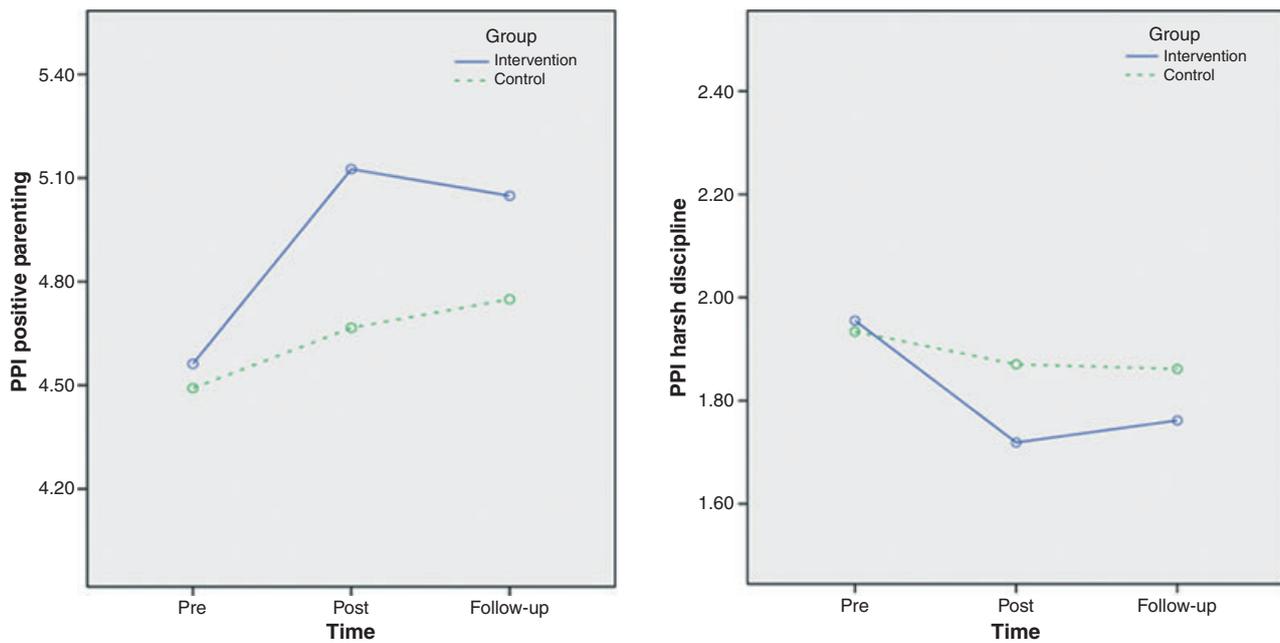


Fig. 1. Change in positive parenting and change in harsh discipline.

There are several ways to interpret the results, and the most obvious reason for the pre-post drop in ECBI scores in the intervention group is related to the children's elevated scores on the ECBI. The children in our study were compared with a representative sample of Norwegian children, and the mean score of our sample was approximately 10 points above the norm. This represents a medium difference according to Cohen's criteria, and the children in our sample had significantly higher scores on the ECBI Intensity scale than the norm for their age groups (Reedtz *et al.*, 2008). Some 35% of the parents also reported parental concern for their child's behavior as an important reason for participating in the study (Reedtz *et al.*, 2010). As the sample in the present study had elevated ECBI scores compared to the norm there was a significant potential for improvement among the few children with the highest scores. However, only a few children in the study had ECBI scores close to the clinical cutoff point, and because the children were all within the normal range we did not expect to find major changes as a result of the parent-training. The lack of effect on the ECBI at one-year follow-up supports this assumption. The lasting changes in parenting may thus be explained by the experience of being a parent (i.e. parent satisfaction and parent efficacy), rather than changes in their children's behavior. Coercive interactions between parent and child are recognized as a fundamental mechanism through which behavioral problems emerge and are sustained over time (Granic & Patterson, 2006; Kazdin, 1997). Along these lines, Gardner *et al.* (1999) have suggested that the timing of parental strategies is important. They suggest that positive parental strategies are more effective when used before misbehavior on the part of the child, and before a pattern of coercion between the parent and child has begun to develop (Gardner *et al.*, 1999). The basis for this assumption is the experience that conflict can be prevented if parents are able to anticipate misbehavior and act pro-socially by using positive parenting strategies before misbehavior occurs. In accordance

with this, we suggest that the age of the children (timing in life) and the fact that they did not have diagnosable behavioral problems (timing related to low levels of coercion in the family) are important factors that contribute to the effects on parenting practices in this study. Moreover, and according to some reports (Ohan, Leung & Johnston, 2000), parent satisfaction (i.e. parents' enjoyment of the parenting role) is negatively related to externalizing child behavior. On the basis of this assumption, the overall normative ECBI scores may explain the positive effects on parent satisfaction in our study.

In our view, the effects on parenting practices in this study relate to core elements in the S-IY intervention. The S-IY intervention advised parents how to play with their children and how to praise and reward the child for positive behaviors. The intervention was presented as a process where parents were advised how to build a more positive relationship with the child by adopting the child's perspective, by being more sensitive to its needs, and by cooperating with the child. The content of these program components have been found to be among the most robust predictors of change in parenting practices as a result of parent training, and are also consistent with decades of developmental theory that suggests that the quality of the parent-child relationship influences a child's behavior or misbehavior (Wyatt Kaminski, Valle, Filene & Boyle, 2008).

A frequent prediction and commonly held belief is that it is difficult to demonstrate an overall beneficial effect in universal preventive strategies, because most members of any given populations will display few or none of the types of behavior to be prevented (Offord, 2000). In the course of the past few years several reports have demonstrated the positive preventive effects of parental training in community samples (Foster *et al.*, 2008; Sanders *et al.*, 2008; Zubrick, Ward, Silburn *et al.*, 2005). The findings of this study suggest that significant and stable changes in parenting can be gained as a result of parent skills training, not only in

treatment and prevention programs targeting children with behavioral problems, but also in the general population. Parent training is a powerful tool for changing parental behavior to a more positive parenting style and to improve their sense of parenting competence. A universal public health approach to the promotion of parenting skills seems crucial to the promotion of good mental health in children. Such an approach should support parenting practices that promote childhood mental health and address risk factors for socio-emotional and behavioral problems (Herrman, Saxena & Moodie, 2005).

An important issue related to the question of whether one should implement parenting intervention as part of a public-health approach is the cost of such interventions. Traditionally, universal parenting interventions are assumed to be rather costly, and this has led policy-makers to advocate interventions targeting only those families most at risk. In a recent study on the costs of a public health infrastructure for delivering parenting and family support (Foster *et al.*, 2008), the results showed that building such an infrastructure throughout a community were rather modest. Foster and his colleagues propose that a public health approach may be a cost-effective way to reduce the rate of abuse and neglect, as well as the incidence of serious childhood behavioral problems. In Scandinavia, where the incidence of socio-emotional and behavioral problems is rather low, we need more research with adequate designs in order to investigate whether a public health approach to positive parenting would reduce the prevalence of disruptive behavior problems, and next, if such an approach would be cost-effective.

Limitations

Interpretation of the results brings up certain methodological problems, of which the most important relate to the study design. Families with children who had high ECBI scores, and therefore the potential to change much, were excluded from the study. The children in the study tended not to need the intervention to improve their behavior and were expected to change very little as a result of the intervention. This design makes it impossible to draw inferences about the preventive effects of the program on children's behavioral problems in a truly universal population. Preventive interventions must be applied to larger samples in order to assess whether the intervention prevents the development of disruptive behavior problems, and the design of such studies needs to include those children who already exhibit high levels of problem behavior. Studies should also collect and analyze data on intervention integrity. The lack of such analyses in the present study limits the confidence of the results.

Another important limitation is that we only examined child behavior based on parents' perceptions, excluding other informants. There is evidence to suggest a correlation between self-report measures of parents and that of observers (Zubrick *et al.*, 2005). These correlations are by no means perfect, but they do give us a certain degree of confidence in parents' self-reports. However, observations of parent-child interactions are needed to further increase the confidence in the results. The sample is also based on parental self-recruitment and is rather homogenous. This also restricts us from generalizing the results to a true normal population.

Furthermore, the study suffered from a rather large attrition from pre- to post-intervention and follow-up. This may reduce the

validity of the results, although Bingham's imputation method, which we used, has been shown to give more accurate estimates than mean substitution in cases where data are missing at random. The helpfulness of this imputation procedure is more limited than it would be with smaller attrition rates, and than it would have been with more than three measurement points. However, we used the method conservatively, so that intervention or control group status was not taken into account when imputing values. The sample size in this study is sufficient for the selected imputation procedure to work. The higher attrition percentage in the control group is likely to be related to the parents' lack of motivation to fill out an extensive questionnaire when no intervention was received. We lack data on why families in the intervention group dropped out after parent training, and this also limits the scope of our study results.

CONCLUSION

Our findings suggest that a shortened version of a well-structured parenting intervention, the Incredible Years program, implemented in primary care at community level, reduces harsh parenting and strengthens positive parenting and parents' sense of competence as reported by the parents. Further research is needed to determine whether a risk reduction strategy in the general population has the potential to reduce the prevalence of specific childhood socio-emotional and behavioral problems.

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