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Implementation quality of a family-focused preventive intervention in a community-based dissemination

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Abstract

The aims of this study were to determine (1) the degree to which an evidence-based intervention (EBI) delivered outside the context of a research trial remained faithful to the content and design of the programme as intended and as reported in experimental trials of the same programme, and (2) whether implementation quality affected programme outcomes. We report results of an observational study of 11 sites involved in the statewide dissemination of a popular family-focused prevention programme, the Strengthening Families Programme for Parents and Youth 10–14. We found numerous differences between the community-based implementations we observed and researcher-driven implementations of the same programme, but variability in programme delivery and adherence to content were unrelated to programme outcomes. We conclude that short-term outcomes of well-designed EBIs delivered by well-trained facilitators may be robust to minor changes in delivery and content. However, the effects of implementation quality on longer-term outcomes are unknown.

Keywords

Translational research; substance-abuse prevention; evidence-based interventions; programme fidelity; implementation

Introduction

Communities with funding to implement substance abuse prevention are able to choose from increasing numbers of evidence-based interventions designated as ‘exemplary’ or ‘model’, and to select programme content based on community needs. Research on the efficacy of such evidence-based interventions (EBIs) provides convincing evidence that the initiation and abuse of substances by youth can be prevented (Madon *et al*, 2008). However, there is also evidence that the effects of EBIs may be diminished when they are translated to

community settings (Tobler & Stratton, 1997). Although research on large-scale, community-driven prevention programme disseminations is sparse (Backer, 2000), several studies of efficacy and effectiveness trials have shown that lower implementation quality is associated with poorer outcomes (Dane & Schneider, 1998). Therefore, in community-based evaluation of EBIs it is especially important to determine the extent to which implementation quality is related to programme outcomes.

In this article we address the issue of implementation quality in a community-based implementation of a family preventive intervention. Specifically, we examine (1) the degree to which an EBI delivered outside the context of a research trial remained faithful to the content and design of the programme as intended (Chen, 1998) and as reported in experimental trials of the same programme (Spoth *et al.*, 2002; Spoth *et al.*, 2003; Spoth *et al.*, 2007; Fagan *et al.*, 2008); and (2) whether implementation quality affected programme outcomes. We report results of an observational study of 11 sites involved in the state-wide dissemination of an evidence-based substance abuse prevention programme, namely the Strengthening Families Programme for Parents and Youth 10–14 (SFP).

Implementation quality: content and context

One of the more common measures of implementation quality is adherence to programme content and to the procedural or structural aspects of programme delivery, sometimes referred to collectively as programme fidelity (Dane & Schneider, 1998; Dusenbury *et al.*, 2003). The content of EBIs is generally printed in a manual (or presented visually on videotape or DVD) in order to allow for standardised delivery across settings. In addition, most EBIs specify procedural aspects of programme delivery, such as number, length and frequency of sessions across which the material is to be delivered. Thus, the implementation of the programme as intended is, in theory, straightforward. Nonetheless, content from programme manuals is often adapted by facilitators for a number of reasons, including time constraints, disagreement with programme content and characteristics of the group to whom the programme is being delivered, including cultural differences (Kumpfer *et al.*, 2002; Hill *et al.*, 2007; Ringwalt *et al.*, 2009). Studies of adherence (ie. the degree to which the standardised content is delivered) have yielded mixed findings: although some researchers find that low adherence results in decreased programme effectiveness, others have found negative effects of high adherence (Sanchez *et al.*, 2007) and still others have found that the adaptation of a programme to local conditions may be an important contributor to positive programme results (Castro *et al.*, 2004). In the present study, we examine average levels of adherence as well as variability across programme sites as one aspect of implementation quality.

An important and under-studied aspect of implementation quality is the extent to which the context of programme delivery affects programme outcomes. Although theory about how programme context might affect outcomes is often implicit rather than explicit (Chen, 1998), there is evidence that contextual variables may be as important or even more important than content in determining intervention outcomes (Kumpfer *et al.*, 2008). For the purposes of this article, we define contextual characteristics of programme delivery as attributes that are not directly related to the content of a programme but instead define the context of its delivery.

For example, the size of a group; facilitators' level of experience and rapport with participants; the age and race or ethnicity of participants and facilitators; proportion of single parents; organisational support; and location of the programme might affect group dynamics, programme implementation, and delivery of programme content, thereby affecting outcomes (Lochman, 2006).

By design, variability in contextual factors and in participant attributes is minimised in experimental trials, in order to control for factors that might be correlated with outcomes. Thus, in a clinical trial of programme efficacy, researchers exercise substantial control over who delivers the programme, the age of participants and group composition, and the training and experience of programme facilitators. In real-world applications, however, facilitators often have fewer resources and less control over these factors. For example, in a clinical trial, every effort is made to ensure that participants do not differ systematically from the population at large, but in a community implementation people may self-select into a programme. If participants self-select based on attributes that are related to programme outcomes (eg. if families of adolescents at high risk for substance use problems are less likely to attend a substance use prevention programme), then experimental estimates of programme efficacy may be higher or lower than the outcomes observed in real-world settings (Hill *et al*, 2010). Similarly, EBIs in non-research settings may use less highly trained or fewer facilitators, or they may be delivered to people in a wider age range or greater variety of ethnic backgrounds than those in experimental trials.

In the present study, we examined the relation of programme outcomes to these individual and contextual factors and to adherence. Specifically, we examined characteristics of participants (age, sex and minority status) and programmes (group size, number of facilitators, facilitator experience and match of minority status between participants and facilitators) that have been shown in previous studies to relate to programme outcomes or that showed considerable variability as compared to the clinical trial.

Implementation of the Strengthening Families Programme

SFP, a universal family-based adolescent substance use prevention programme, is a seven-week intervention for parents or caregivers and youth aged 10–14 years (Molgaard & Spoth, 2001; Molgaard *et al*, nd). For each of the seven weekly sessions, parents and youth spend one hour separately and a second hour together engaging in interactive exercises led by trained facilitators. The programme, delivered in numerous countries around the world, has a manual and includes video/DVD examples as a component of many lessons. Facilitator training is standardised.

Results from the experimental efficacy trial demonstrated that SFP reduced the age of initiation and frequency of substance use among participants as compared to controls (Spoth *et al*, 2009). Results from a controlled experimental study on a community team-based dissemination of SFP and other EBIs also showed significant differences between SFP and control group outcomes over time, though in that trial all children also received evidence-based prevention programmes at school (Spoth *et al*, 2007).

Observational studies of implementation quality in the original efficacy trial of SFP, a feasibility trial of SFP with African–American families, and the experimental community trials of SFP all indicated high levels of adherence to programme content (assessed as percentage of programme content and activities that were covered). In the initial clinical trial (Iowa SFP, or ISFP), Spoth and colleagues (2002) reported adherence ranging from 83% of content covered in the seven parent sessions to 87% in seven family sessions and 89% in seven youth sessions. They classified groups as either high (N=8) or low adherence (N=3) and compared ISFP parent and youth outcomes to control group outcomes at post-test and one-and-a-half years past baseline. In the first assessment, ISFP outcomes were significantly higher than control-group outcomes, regardless of whether the programmes were classified as high or low adherence. At the later assessment, however, ISFP outcomes were significantly different from those of the control group only in the high-adherence group. In other words, although adherence did not appear to matter in the short term, over the long term individuals in the high-adherence group fared better.

In observations of programmes delivered as part of the community team-led trial (PROmoting School–community–university Partnerships to Enhance Resilience, or PROSPER), Spoth and colleagues (2007) examined the relationship of implementation quality to community team functioning. Average adherence in 14 programmes across all 21 sessions was 90% (range = 48–100%) in a first cohort and 91% (range = 24–100%) in a second cohort. In addition to adherence, the PROSPER study also assessed the quality of facilitation and participants' engagement. Researchers found no significant association of any of the three indicators of SFP implementation quality (adherence, participant engagement or facilitation quality) with community team functioning.

In both studies, investigators speculated that because implementation quality was high and variability across programmes was limited, potential relations between adherence and outcomes may have been obscured. In a third study, the programme was slightly adapted to be more culturally relevant and delivered to African–American families. Adherence rates were 87% in the parent sessions, 92% in family sessions and 84% in youth sessions; information about the relationship of adherence to outcomes was not published (Spoth *et al*, 2003). In one additional study of implementation fidelity in 13 school- and family-based EBIs, researchers observed 15 implementations of SFP 10–14 and found an average adherence rate of 94% (Fagan *et al*, 2008).

The present study

In the present study, we report on implementation quality in programme sites that were part of an ongoing dissemination of SFP that is loosely co-ordinated by the US extension system of a state land-grant university (Mincemoyer, 2002) and by the Division of Behavioral Health and Recovery, a branch of the state Department of Social and Health Services (DSHS). Other state agencies involved with prevention services also participate in the collaborative dissemination and evaluation effort. Decisions to implement SFP occur at the community level – for example, the prevention co-ordinator of a school system may decide to send a team of school staff to be trained, and will fund the training and programme implementation out of the school district's prevention budget. Programmes are also

implemented by faith-based organisations, social service agencies, the juvenile justice system and community substance-abuse prevention coalitions. The extension system offers planned and on-demand facilitator trainings, conducted by trainers who have been certified by the programme developer and publicised through a website, schools, local media and local and state social service agencies. Implementation quality and adherence to programme content are emphasised as part of the standardised training protocol. Facilitators who attend extension trainings are requested to participate in the ongoing programme evaluation when they deliver the programme; those who elect to do so are given technical assistance by a university-based faculty member and trained research assistants, who also supervise the analysis of outcome and implementation data. Community agencies that submit data are provided with reports describing programme outcomes and implementation and comparing programme data with statewide averages. Thus, the data on implementation and outcomes reported in this article differ from those reported in the efficacy and effectiveness trials, in that the dissemination is not researcher-driven.

To summarise, the goals of the present study were (1) to examine programme implementation (adherence and programme context) in a real-world, community-driven dissemination, and (2) to examine the relation of adherence and context to short-term programme outcomes (defined as change from pre-test at the beginning of the programme, to post-test, seven weeks later). With regard to the first goal, we expected to find lower adherence and greater variability in group size and other implementation factors in the community-based programmes than has been reported in the experimental trials. Our hypothesis related to the second goal was that greater adherence would be associated with more positive programme outcomes.

Method

Observation procedure

We conducted an observational study on a subset of programmes delivered statewide over the course of six months. We identified upcoming SFP implementations by contacting individuals who had attended trainings or provided programme evaluations previously and asked if facilitators would participate in an observational study of fidelity. We found 12 respondents who were planning to implement a programme; all but one agreed to be observed. We asked facilitators to allow two observers to attend three of the seven nights of the programme and offered a US\$250 incentive to be applied to the programme meal fund, facilitator payments, or other programme funding needs. Trained observers (a graduate student and the SFP state project evaluation co-ordinator) attended each programme either singly or in pairs. When two observers were present, one observed the youth and family sessions and the other observed the parent and family sessions. Some facilitators were concerned about having outsiders present on the programme's first night; thus, we did not observe 'night one' but did observe all other nights. Observers sat in on each session in an area of the room that was most unobtrusive, usually at the back of the room, and completed implementation fidelity forms during the session. In all, we collected data from 25 youth sessions, 29 parent sessions and 34 family sessions across 11 programme sites.

Programme evaluation procedure

On the first night of the programme, facilitators administered pencil-and-paper pre-tests, followed by post-tests at the end of the last night, seven weeks later. Parents and youth completed evaluation forms in separate rooms. Facilitators read items aloud for youth sessions; the standard procedure in adult sessions was for parents to read and complete the evaluation forms themselves, but facilitators occasionally read items aloud in adult sessions as well. The evaluation procedure was approved by the institutional review board of the state's Department of Social and Health Services.

Sample

Of the 11 programmes we observed, six were hosted by schools, two by faith-based organisations, one by a substance abuse rehabilitation centre, and two did not report sponsoring agencies. The number of facilitators per programme ranged from two to seven, with a mode and mean of four, and the number of families ranged from four to 26, with a mode of eight and a mean of 12.4. Sixty-eight per cent of families attended five or more of the seven programme nights (Table 1).

There were 47 facilitators (81% female). Most facilitators had some education beyond high school: 32% graduated from high school or had a General Educational Development (GED), 36% had a Bachelors degree and 32% had a Masters degree. Thirty-two per cent had attended one training session, 13% had attended two training sessions and 17% had attended three training sessions. Nineteen per cent of facilitators were listed as not having attended an SFP training session. However, these facilitators were in programmes that reported at least three other trained facilitators and might more properly be considered programme assistants than actual facilitators. Fifteen per cent did not report on training. Thirty-four out of the 47 facilitators reported white/European-American descent, one Latino and six American Indian. Eleven did not report race or ethnicity. Twenty-nine per cent had implemented once previously, 42% two to three times, 21% four to six times and five per cent had implemented the SFP 10 to 12 times. Most reported several years of general experience related to programme delivery, with only one person reporting no previous experience. Forty per cent of the sample had one to three years of experience, 29% had five to 10 years, 11% had 12 to 16 years and 18% had between 20 and 40 years of experience.

There were 151 adult participants (59% female) and 144 youth participants (47% female) in the 11 programmes at pretest. The average age of adults was 37.9 (SD = 8.65) and of youth was 11.54 (SD = 1.79). Sixty-eight per cent of adult participants were white/European, 11% Latino, 11% American Indian, two per cent black/African-American, seven per cent multiple ethnicity and three per cent other. Forty-seven per cent of youth participants were female, 62% white/European-American, 13% Latino, nine per cent American-Indian, 10% multiple ethnicity, three per cent black/African-American and three per cent other race or ethnicity. Because of the small numbers in most categories, we created a variable to represent whether a person was of minority race/ethnicity (coded as 1) or white/European-American (coded 0) rather than using the self-reported categories described above.

Measures

At the programme level we used implementation forms originally developed for fidelity assessment of the SFP randomised controlled trials (Spoth *et al*, 2002), with slight modifications after pilot testing (eg. to break double-barreled items into singly-rated items). Each programme session (ie. parent, youth or family session) is made up of several modules defined by the programme developers, and within each module are several activities. For example, on one night the parent session begins with a review of home practice activities (Module 1), in which facilitators ask parents what limits they set for their child during the week (Activity 1), how they showed love to their child (Activity 2) and what has been working well at home (Activity 3). The number of activities per session ranges from 30 to 98. The fidelity forms covered all activities within each session, including a score for each game, activity and other content comprising the module. Observers rated each activity on a three-point scale indicating whether the module content was covered completely, partially or not at all. For the purposes of comparison with previous studies of SFP adherence, we dichotomised each activity's scores so that 0 = 'Activity not attempted' and 1 = 'Activity completed or attempted'.

Adherence scores were then computed as a percentage of the total possible adherence score per session ('number of activities completed or attempted'/'total number of activities'), then averaging scores across nights. For example, if 90% of activities were completed or attempted in one parent session (45 activities out of a possible 50), 100% in a second parent session (38 activities out of a possible 38) and 80% in a third parent session (48 activities out of a possible 60), the adherence score for parent sessions would be 90%. Thus, adherence scores represent a percentage of the total possible adherence across all observations within a programme, calculated both as a single score (Total Adherence) and by type of session (Family Session Adherence, Parent Session Adherence and Youth Session Adherence). We used a percentage rather than a sum because each session had a different maximum adherence score and different combinations of programme nights, and sessions within nights, were observed across programmes. Final adherence scores represent the average adherence scores across all nights observed.

Also at the programme level, the lead facilitator for each programme completed an implementation survey with questions about programme attributes (group size, programme location, funding sources, number of facilitators) and facilitators (years of experience with prevention programme delivery and number of SFP trainings attended, demographic characteristics). We created a variable to indicate whether there was a match of race/ethnicity between facilitator and participants, coded 0 if there were one or more minority participants but no minority facilitators and 1 otherwise.

For participant outcomes we used a 13-item measure of intervention-targeted parenting attitudes and behaviours (ITPB), which was also used in the original SFP research trial (Spoth *et al*, 1995). Items on the ITPB were rated on a five-point Likert-type scale with response options ranging from 1 (strongly disagree) to 5 (strongly agree). Items are designed to assess parenting skills targeted by the programme: family communication and enjoyment,

temper management, clarity of rules, consistency of discipline and opportunities and rewards for prosocial behaviours.

Attrition

On average, 68% of families participated in five or more sessions of the seven, which is consistent with rates reported in other community-based programme implementations (Spoth *et al*, 2003) but lower than rates reported in experimental trials. Adults who remained did not differ from those who left the programme on baseline measurements of the ITPB outcome measure, race/ethnicity or age. Families with girls were significantly more likely to remain than those with boys ($2 = 7.39$ $p < .01$).

Results

Descriptive statistics for variables used in outcome analyses

In Table 2, opposite, we present the means, standard deviations and intercorrelations of all variables used in the outcomes analyses. It can be seen that adherence was strongly negatively associated with the number of families attending a programme ($r = -.72$, $p < .001$) but positively associated with number of facilitators ($r = .62$, $p < .001$). Adherence was also negatively associated with average (within programme) years of facilitators' experience ($r = -.57$, $p < .001$) and positively correlated with the presence of a match between participant and facilitator minority status ($r = .51$, $p < .001$). Average facilitator experience was negatively associated with the number of facilitators leading a programme but positively associated with number of families attending.

In Table 2 we also note the average pre-test scores ($M = 3.90$, $SD = 0.53$) and post-test scores ($M = 4.23$, $SD = 0.54$) on the Intervention-Targeted Parenting Behavior Scale. Improvement from pre-test to post-test was significant, as indicated by paired t-tests ($t = 6.65$, $p < .001$) as well as by the multi-level model results presented below.

Participant and programme characteristics in experimental versus community-based SFP

In Table 1, we compare characteristics of SFP as delivered in the experimental trials and as delivered in the community-based implementation. As hypothesised, there were substantial differences in some aspects of implementation. For example, ages ranged from 10 to 12 in the efficacy and effectiveness trials but from six to 17 in the programmes observed for this study; experimental programmes reported three facilitators per programme whereas our programmes averaged four and ranged from two to seven; and the average number of families was eight in the experiments but 12 in our programmes. Completion rates (68% attending five or more nights) were substantially lower than those reported in the ISFP efficacy trial (94%) but closer to those reported in the PROSPER trial (63% completing six or more nights). The percentage of minorities attending was 1.2% in the ISFP efficacy trial and 32% in the present study.

Observer ratings of adherence to programme content

Average adherence to programme content was 81% overall ($SD = 7\%$), 84% in the parent sessions ($SD = 6\%$), 78% in the youth sessions ($SD = 12\%$) and 81% in the family sessions

(SD=8%). However, there was a wide range of adherence scores across nights as well as across programmes: average total adherence (across all sessions) ranged from 68% to 90%, and variability of the average within-session adherence (parent, youth or family) was even greater – for example, average adherence in youth sessions ranged from 51% to 98%. In Table 1 we present comparisons of fidelity data across studies. Total adherence (81%) was lower in this community-based study than in experimental studies (86%, 90% and 94% respectively). In Figure 1, opposite, we present data showing the average adherence per night in our study for parent, youth and family sessions. The error bar for each night represents variability across programmes – for example, the average adherence on Night 7 in the family session was 78% and ranged from a low in one programme of 71% to a high in one programme of 89%.

Association of participant and programme characteristics with outcome

We used multi-level models to examine the effects of participant and programme characteristics on programme outcomes and to test our hypothesis that greater adherence would be associated with more positive outcomes (Table 3). (We used adherence scores from the parent session as most directly relevant; however, analyses with adherence scores from the family and youth sessions were essentially the same and with the same pattern of significant values.) Ninety-six parents from all 11 programmes completed both pre-test and post-test.

In the first column of Table 3 we present estimates associated with the unconditional model. The intraclass correlation (ICC), calculated as the proportion of programme-level variance divided by the total variance (Singer, 1998), was 28%, which indicates that there was a good deal of clustering of ITPB scores within programme site (ie. greater similarity of individuals within a programme than would be expected by chance). If this type of clustering is not accounted for, the assumption that observations are independent is violated, the standard error is underestimated and non-significant results are more likely to appear significant (ie. Type I error becomes more likely). The use of multi-level modelling takes care of this problem by separating programme-level estimates of variance from individual-level estimates of variance. Although the approach is more conservative than ordinary least-squares regression, our power (with a sample size of 11 programmes and an average of 12 families per programme) was .83 and therefore adequate to detect programme-level effects.

In Model 1 we added participant characteristics and controlled for ITPB pretest scores. Females and minority participants reported significantly less change from pre-test to post-test than males and non-minority participants. In Model 2 we added programme and facilitator characteristics, including group size (number of families), number of facilitators, within-programme average years of experience in programme delivery, participant-facilitator match in minority status and adherence scores. Contrary to our expectations, none of the facilitator or programme-level variables was significantly related to change in parenting scores. However, with the inclusion of facilitator and programme variables, the between-programme estimate of variance decreased by 50%, from .0466 to .0287, and became non-significant, indicating that much of the explainable variance across programmes in parent outcome was accounted for by these variables. In Model 2, when both programme-

level and individual-level variables were included, only individual characteristics predicted change in ITPB scores (with females and minorities reporting lower rates of change).

Discussion

The purpose of this article was to examine the effects of implementation quality, participant characteristics and programme context on participant outcomes in the community-based dissemination of an evidence-based preventive intervention, the Strengthening Families Programme for Parents and Youth 10–14. Previous studies have reported significantly improved parenting practices and reduced levels of substance use in SFP participants as compared to control groups. However, these previous studies were conducted in the context of research trials, with samples representative of local populations, high levels of adherence to programme content and, by design, limited variability across programmes in participant and programme characteristics. In contrast, this study is part of a ‘bottom-up’ following of an uncontrolled, non-researcher-driven dissemination of the programme as it occurs naturally across a large state in the US Northwest. This type of dissemination represents practice as usual in most areas: decisions to implement an EBI are taken locally, by individuals or organisations; facilitators are often trained but are generally not supervised by programme developers or their delegates; recruitment varies from place to place and participants self-select into a programme; and quality control is not centralised. Because of this lack of centralised control and because, historically, funding agencies have generally restricted research funding to controlled, experimental trials in order to establish programme efficacy or effectiveness, research on community-driven implementations is sparse. However, as programmes have been designated effective and made available to the public, translational research on their performance under real-world conditions has become increasingly important.

As expected, we found substantial variability across programmes in implementation quality and in programme and participant characteristics. For example, 99% of participants in the original clinical trial of SFP but only 68% in the real-world dissemination were white/European–American. In addition, the average group size of programmes in this study sample was larger (eg. 12.4 in this study vs 7.5 in the ISFP clinical trial); there were more facilitators on average (4 vs 3); adherence to content was lower (81% vs 86–90%), and attrition was greater (eg. 68% attending five or more sessions vs 94%). Consistent with previous studies of SFP, we found significant short-term improvement in parenting practices. Also consistent with previous work, we found no relationship of adherence to short-term programme outcomes, and no relationship of programme context or facilitator attributes to programme outcomes either. In those previous studies, one explanation offered for the failure to find an association of adherence to outcome was restriction of range: adherence was high and variability was low (Spoth *et al*, 2007). In this study, adherence remains high, but the range of adherence scores and variability around average scores is greater; thus, restriction of range is a possible but less likely explanation for the lack of association. Another possibility is that multi-collinearity among independent variables obscured true relationships through inflation of standard errors. However, in post hoc tests, eliminating those variables with the greatest variance inflation factors (adherence and facilitator experience) did not result in substantially different parameter estimates or

significance levels for remaining variables. Short-term measures of change may not capture longer-term relationships of programme variables, including adherence, to outcomes (Spoth *et al*, 2002). Finally, it is possible that the SFP effects are simply robust to variations across participant, facilitator and programme attributes.

The 11 programmes that were observed for this study were a convenience sample, not randomly selected, and in some ways not representative of the larger sample, currently over 350 programmes, from the community-based dissemination we report on here. For example, the percentage of non-white participants in the larger sample is greater and there is a wider geographical spread. We suspect that variability in implementation quality and programme characteristics would only increase with a larger and more representative sample of the programmes that have been delivered in this particular large-scale dissemination or in real-world settings generally. However, it is more difficult to speculate about whether that variability would result in substantial differences in programme outcomes.

Conclusion and implications for practice

The present study demonstrated that implementation of SFP is more variable in a real-world dissemination of the programme than in researcher-driven experimental trials. Despite that variability, adherence remained high and there was significant short-term improvement in parenting practices. Some participant attributes predicted change from pre-test to post-test, but facilitator and programme attributes, including adherence, did not predict change. Although these findings suggest that the positive results of SFP experimental trials may generalise across variations in people, settings and levels of treatment (Shadish *et al*, 2002), the present study does not allow us to make this assertion with confidence, especially with regard to long-term outcomes. Additional studies with larger sample sizes are needed to assess the effects of contextual variables with greater accuracy, and the analysis of adherence to specific programme components, rather than of a simple percentage of material covered, may help to identify critical ingredients that have greater influence on programme effects.

However, our study, and others showing that minor variations in programme delivery and adherence to content were unrelated to outcomes, have important implications for policy and practice. First, these studies suggest the possibility that well-designed programmes with a strong evidence base and with well-specified training protocols may be robust to minor variations in implementation quality. Because such variations are inevitable in real-world disseminations, and because extensive monitoring of programme quality outside of a research context is highly resource-intensive, there may be greater value in applying some of those resources to programme training and delivery rather than to programme monitoring and evaluation. Second, although programme attributes did not predict short-term change in outcomes in the present study, participant attributes did. In addition, it is well established that family attributes are related to programme recruitment and attendance, and population-level programme effects may be diminished as a result of such selection effects. This suggests that greater attention to programme participation (who participates, how they are recruited, who benefits most and which practices and conditions foster retention and regular attendance) is warranted in order to increase our understanding of the true value of universal

prevention programmes. Facilitator training should include information about targeted recruiting for participants who are less likely to attend (eg. minority families or families with girls); retention for families who are more likely to drop out (eg. those with boys); and ensuring that participants are in the specified age range.

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References

- Backer TE. The failure of success: challenges of disseminating effective substance abuse prevention programmes. *Journal of Community Psychology*. Special Issue: Bridging the gap between research and practice in community-based substance abuse prevention. 2000; 28:363–373.
- Castro FG, Barrera M Jr, Martinez CR Jr . The cultural adaptation of prevention interventions: resolving tensions between fidelity and fit. *Prevention Science*. 2004; 5:41–45. [PubMed: 15058911]
- Chen, H-T. Theory-driven evaluations. In: Reynolds, AJ.; Walberg, HJ., editors. *Advances in Educational Productivity*. Volume 1997: Evaluation research for educational productivity. US: Elsevier Science/JAI Press; 1998. p. 1915-1934.
- Dane AV, Schneider BH. Program integrity in primary and early secondary prevention: are implementation effects out of control? *Clinical Psychology Review*. 1998; 18:23–45. [PubMed: 9455622]
- Dusenbury L, Brannigan R, Falco M, Hansen WB. A review of research on fidelity of implementation: implications for drug abuse prevention in school settings. *Health Education Research*. 2003; 18:237–256. [PubMed: 12729182]
- Fagan AA, Hanson K, Hawkins JD, Arthur MW. Bridging science to practice: achieving prevention program implementation fidelity in the community youth development study. *American Journal of Community Psychology*. 2008; 41:235–249. [PubMed: 18302016]
- Hill LG, Goates S, Rosenman R. Detecting selection effects in community disseminations of universal family-based prevention programs. *American Journal of Public Health*. 2010; 100:623–630. [PubMed: 20167902]

- Hill LG, Maucione K, Hood BK. A focused approach to assessing program fidelity. *Prevention Science*. 2007; 8:25–34. [PubMed: 16967341]
- Kumpfer KL, Alvarado R, Smith P, Bellamy N. Cultural sensitivity and adaptation in family-based prevention interventions. *Prevention Science*. 2002; 3:241–246. [PubMed: 12387558]
- Kumpfer KL, Pinyuchon M, de Melo AT, Whiteside HO. Cultural adaptation process for international dissemination of the Strengthening Families Program. *Evaluation & The Health Professions*. 2008; 31:226–239. [PubMed: 18448857]
- Lochman JE. Translation of research into interventions. *International Journal of Behavioral Development*. 2006; 30:31–38.
- Madon S, Guyll M, Buller AA, Scherr KC, Willard J, Spoth R. The mediation of mothers' self-fulfilling effects on their children's alcohol use: self-verification informational conformity and modeling processes. *Journal of Personality and Social Psychology*. 2008; 95:369–384. [PubMed: 18665708]
- Mincemoyer C. 4-H School Enrichment: a school and community partnership. *The School Community Journal*. 2002; 12:107–116.
- Molgaard V, Spoth R. The Strengthening Families Program for young adolescents: overview and outcomes. *Residential Treatment for Children & Youth*. Special Issue: Innovative mental health interventions for children: programs that work. 2001; 18:15–29.
- Molgaard, VK.; Kumpfer, K.; Fleming, E. Strengthening Families Program for Parents and Youth 10–14: A video-based curriculum (Leader Guide). Ames, Iowa: Iowa State University Extension; nd.
- Ringwalt CL, Pankratz MM, Hansen WB, Dusenbury L, Jackson-Newsom J, Giles SM, Brodish PH. The potential of coaching as a strategy to improve the effectiveness of school-based substance use prevention curricula. *Health Education Behavior*. 2009; 36:696–710. [PubMed: 17652615]
- Sanchez V, Steckler A, Nitirat P, Hallfors D, Cho H, Brodish P. Fidelity of implementation in a treatment effectiveness trial of Reconnecting Youth. *Health Education Research*. 2007; 22:95–107. [PubMed: 16807378]
- Shadish, WR.; Cook, TD.; Campbell, DT. *Experimental and Quasi-experimental Designs for Generalized Causal Inference*. Boston MA: Houghton Mifflin and Company; 2002.
- Singer JD. Using SAS PROC MIXED to fix multilevel models, hierarchical models, and individual growth models. *Journal of Educational and Behavioral Statistics*. 1998; 23:323–355.
- Spoth R, Guyll M, Chao W, Molgaard V. Exploratory study of a preventive intervention with general population African-American families. *The Journal of Early Adolescence*. 2003; 23:435–468.
- Spoth R, Guyll M, Lillehoj CJ, Redmond C, Greenberg M. PROSPER study of evidence-based intervention implementation quality by community – University partnerships. *Journal of Community Psychology*. 2007; 35:981–999. [PubMed: 20376336]
- Spoth R, Guyll M, Trudeau L, Goldberg-Lillehoj C. Two studies of proximal outcomes and implementation quality of universal preventive interventions in a community-university collaboration context. *Journal of Community Psychology*. 2002; 30:499–518.
- Spoth R, Redmond C, Haggerty K, Ward T. A controlled parenting skills outcome study examining individual difference and attendance effects. *Journal of Marriage and Family*. 1995; 57:449–464.
- Spoth R, Trudeau L, Guyll M, Shin C, Redmond C. Universal intervention effects on substance use among young adults mediated by delayed adolescent substance initiation. *Journal of Consulting and Clinical Psychology*. 2009; 77:620–632. [PubMed: 19634956]
- Spoth RL, Redmond C, Shin C. Randomized trial of brief family interventions for general populations: adolescent substance use outcomes 4 years following baseline. *Journal of Consulting and Clinical Psychology*. 2001; 69(4):627–642. [PubMed: 11550729]
- Tobler NS, Stratton HH. Effectiveness of school-based drug prevention programs: a meta-analysis of the research. *Journal of Primary Prevention*. 1997; 18:71–128.

Summary of policy and practice implications

- Variability in programme implementation is inevitable in real-world disseminations, and extensive monitoring of programme quality outside of a research context is highly resource-intensive. In the dissemination of well-designed family interventions with strong training protocols, there may be greater value in applying some of those resources to programme training and delivery rather than to programme monitoring and evaluation.
- Family attributes are related to programme recruitment and attendance, as well as to programme outcomes, and population-level programme effects are more likely to be influenced by selection effects than by minor variations in programme delivery. This suggests that greater attention to programme participation (who participates, how they are recruited, who benefits most and which practices and conditions foster retention and regular attendance) is warranted in order to increase our understanding of the true value of universal prevention programmes.

Figure 1.

Average levels of adherence across parent, youth and family sessions, by night

NOTE: Bars represent average adherence across all programmes, by night and by type of session (Parent, Youth or Family). Error bars represent the range from minimum to maximum adherence score across programmes.

Table 1

Comparison of participant and programme characteristics, including adherence, across studies of the Strengthening Families Programme

	ISFP Efficacy trial	PROSPER Experimental community-based trial	SFP 10-14 Experimental feasibility trial for African- American families	CYDS SFP-10-14 Experimental community-based trial	SFP 10-14 Non-experimental community- based dissemination
<i>Programme Cycles</i>	N=11	N=142	N=5	N=15	N=11
<i>Participants</i>					
Caregiver Age	M=37.3 (female) M=40.1 (male)	--	M=38.4, SD=8	--	M=37.9, SD=8.7
Target Child Age	M=11.3, SD=.03	6th grade	M=10.5, Range=10-12	--	M=11.5, SD=1.8 Range=6-17
Minority	1.2%	--	100%	--	32%
<i>Programme</i>					
Number of facilitators	3	3	3	--	M = 4, Range = 2 to 7
Attendance rates	94% (5 or more)	63% (6 or more)	64% (4 or more)	--	68% (5 or more)
Number of families	M=7.5 families and 20 individuals Range = 3-15 families	--	M=8 (Cohort 1) M=11 (Waitlist control)	--	M=12.4 families and 26 individuals Range=4-26 families
<i>Adherence</i>					
Parent sessions	83%	88%	92%	--	84%
Youth sessions	89%	91%	84%	--	78%
Family sessions	87%	92%	87%	--	81%
Overall	86%	90% (Overall range = 87-94% Session range = 24-100%)	--	94% (Overall range = 81-99%)	81% (Overall range = 68-90% Session range = 51-98%)

NOTE: N=number of programme sites providing data. ISFP=Iowa Strengthening Families Programme data from Spoth *et al.*, 2001; PROSPER data from Promoting School-Community Partnerships to Enhance Resilience (Spoth *et al.*, 2007); SFP 10-14 Experimental feasibility trial data from Spoth *et al.*, 2003; CYDS SFP 10-14 data from Community Youth Development Study (Fagan *et al.*, 2008); SFP 10-14 non-experimental data from the present study. Blank cells indicate that the information was either not collected or not available.

Table 2

Participant, programme and facilitator variables: correlations and descriptive statistics (N=151)

Variables	1	2	3	4	5	6	7	8	9	10
1. ITPB Pretest	-									
2. ITPB Posttest	.61	-								
3. Participant Age	.02	.04	-							
4. Participant Sex (Female)	.09	-.22*	-.14	-						
5. Minority Status	-.15	-.36**	-.27**	.12	-					
6. Number of Families	-.14	-.32*	.03	.00	.19*	-				
7. Number of Facilitators	.14	.13	-.26**	-.13	.07	-.28**	-			
8. Facilitator Experience	.06	.12	.29**	-.09	-.36**	.31**	-.30**	-		
9. Minority Status Match ^a	.13	.11	-.26**	.02	.34**	-.30*	.69**	-.27**	-	
10. Adherence	.14	.19	-.27**	-.05	.02	-.72**	.62**	-.57**	.51**	--
M	3.90	4.23	37.85	0.68	0.28	12.42	4.73	11.04	0.07	0.84
SD	0.53	0.54	8.65	0.47	0.45	6.91	1.21	8.20	0.26	0.06
Range	2.4–5.0	3.0–5.0	21–67	0–1	0–1	4–26	2–7	1.7–35.0	0–1	.71–.90

Note: Total number of parents was 151; 96 parents completed both pretest and posttest;

^aMinority Status Match: 0=if programme had minority participants but no minority facilitator, 1=if programme had minority participants and at least one minority facilitator.*
p < .05.**
p < .005.

Table 3

Mixed models of participant and programme effects on parent outcomes

N=11 programmes and 96 parents					Unconditional Model				Model 1				Model 2			
Fixed Effects	B	SE	t	p	B	SE	t	p	B	SE	t	p	B	SE	t	p
Intercept	4.23	0.10	42.67	<.001	1.94	0.35	5.53	<.001	-0.21	2.68	-0.08	.94				
<i>Level 1 Predictors</i>																
ITPB Pretest					0.58	0.83	6.98	<.001	0.57	0.09	6.71	<.001				
Age					-.01	0.01	-1.80	.075	-0.01	0.01	-1.50	.14				
Sex (1 = Female)					-0.23	0.08	-2.86	.021	-0.23	0.08	-2.83	.01				
Minority					-0.39	0.12	-3.37	.028	-0.32	0.12	-2.66	.06				
<i>Level 2 Predictors</i>																
Number of Families									-0.01	0.02	-0.35	.74				
Number of Facilitators									-0.01	0.08	-0.13	.90				
Facilitator Experience									0.02	0.01	1.34	.25				
Minority Status Match									0.07	0.24	0.28	.79				
Adherence									2.45	2.92	0.84	.45				
<i>Random Effects</i>																
Programme	Est.	SE	Z	p	Est.	SE	Z	p	Est.	SE	Z	p				
	.0747	.0407	1.84	.03	.0466	.0274	1.70	.04	.0287	.0212	1.35	.09				
Individual	.1932	.0277	6.97	<.001	.1090	.0171	6.38	<.001	.1108	.0176	6.28	<.001				

Note: ITPB = Intervention Targeted Parenting Behaviors scale score.