

Person-to-Person Interventions Targeted to Parents and Other Caregivers to Improve Adolescent Health

A Community Guide Systematic Review

Barri Burrus, PhD, Kimberly D. Leeks, PhD, MPH, Theresa Ann Sipe, PhD, MPH, Suzanne Dolina, MPH, Robin Soler, PhD, Randy Elder, PhD, Lisa Barrios, DrPH, Arlene Greenspan, DrPH, Dan Fishbein, MD, Mary Lou Lindegren, MD, Angeli Achrekar, MPH, Patricia Dittus, PhD, Community Preventive Services Task Force

Context: Adolescence marks a time when many young people engage in risky behaviors with potential implications for long-term health. Interventions focused on adolescents' parents and other caregivers have the potential to affect adolescents across a variety of risk and health-outcome areas.

Evidence acquisition: *Community Guide* methods were used to evaluate the effectiveness of caregiver-targeted interventions in addressing adolescent risk and protective behaviors and health outcomes. Sixteen studies published during the search period (1966–2007) met review requirements and were included in this review.

Evidence synthesis: Effectiveness was assessed based on changes in whether or not adolescents engaged in specified risk and protective behaviors; frequency of risk and protective behaviors, and health outcomes, also informed the results. Results from qualifying studies provided sufficient evidence that interventions delivered person-to-person (i.e., through some form of direct contact rather than through other forms of contact such as Internet or paper) and designed to modify parenting skills by targeting parents and other caregivers are effective in improving adolescent health.

Conclusions: Interventions delivered to parents and other caregivers affect a cross-cutting array of adolescent risk and protective behaviors to yield improvements in adolescent health. Analysis from this review forms the basis of the recommendation by the Community Preventive Services Task Force presented elsewhere in this issue.

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From RTI International (Burrus, Leeks, Dolina); Research Triangle Park, North Carolina; the Community Guide Branch, Division of Health Communication and Marketing, National Center for Health Marketing (Sipe, Soler, Elder); Coordinating Center for Health Promotion, Adolescent and School Health (Barrios, Dittus); Coordinating Center for Environmental Health and Injury Prevention (Greenspan); Coordinating Center for Infectious Disease (Fishbein, Lindegren); Office of Global Health (Achrekar); CDC, Atlanta, Georgia*

*Affiliations during time when research was conducted.

Names and affiliations of the Task Force members can be found at www.thecommunityguide.org/about/task-force-members.html

Address correspondence to: Randy W. Elder, PhD, Guide to Community Preventive Services, Epidemiology and Analysis Program Office, CDC, 1600 Clifton Road, Mailstop E-69, Atlanta GA 30333. E-mail: rfe3@cdc.gov.

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Context

Adolescence marks a critical period in a young person's life, one filled with pivotal biological, cognitive, emotional, and social changes. During this dynamic developmental period, some risk taking is considered a normal part of development.¹ Through taking risks, adolescents learn and oftentimes adopt new behaviors and attitudes. This process contributes to creating a sense of personality and identity, which usually exists separate from the persona that adolescents portray among family.² Risk taking also allows adolescents to gain peer acceptance and respect; cope with anxiety, frustration, and the anticipation of failure; and confirm for themselves and significant others certain attributes of identity.³

Although some risk taking is considered normal during adolescence, engaging in certain types of risky behavior can have adverse and potentially long-term health consequences. Faced with the combination of developmental issues unique to this stage in their life, adolescents are often confronted with health-risk behavior choices, such as whether or not to use alcohol, tobacco, and other drugs (ATOD) and whether or not to engage in unprotected sex that can lead to long-term adverse health outcomes. For example, approximately 72% of all deaths among adolescents are attributed to injuries related to motor vehicle crashes, all other unintentional injuries, homicide, and suicide. Risk behaviors such as physical fighting, carrying weapons, and failing to use seat belts are highly associated with these fatal injuries.^{4,5}

Despite intervention attempts, recent statistics suggest that risk behaviors remain problematic as some measures of adolescent risk taking and associated undesirable health outcomes remain high or are increasing. For example, whereas illicit drug use has declined among adolescents, rates of nonmedical, prescription, and over-the-counter drug use remain high.⁶ One in four teenage girls is currently infected with at least one sexually transmitted infection (STI).⁷ Although teen birth rates have declined since 1991, they remain higher than those in other high-income countries. In 2009, the national teen birth rate in the U.S. was 39.1 births per 1000 women, with higher rates among Southern states and among black and Hispanic teens.⁸

Risk behaviors and outcomes are diverse in nature, yet from both the theoretic and empirical perspectives, these behaviors tend to cluster among adolescents.⁹ *Problem behavior theory* states that involvement in any one risk behavior increases the likelihood of involvement in other risk behaviors, because of their linkages in the social ecology of youth.³ As a result, problem behavior theory would suggest these behaviors tend to occur in clusters for any particular adolescent. Moreover, there are social opportunities to learn and practice risk behaviors together, and because the behaviors may have similar psychological meanings and functions (e.g., overt repudiation of conventional norms or expression of independence from parental control), adolescents are more likely to engage in more than one risk behavior.^{10,11} For example, the use of alcohol and other drugs is linked to violence, unintentional injuries, and risky sexual behaviors.^{10,12}

Many interventions focus on mitigating risk taking for specific risk behaviors (e.g., sexual behavior, ATOD use, or violence), but some evidence suggests interventions that promote healthy adolescent development in one health outcome also may have beneficial effects that enhance protective factors or decrease risk behaviors in

other adolescent health outcomes.^{13,14} Single interventions that could reduce multiple adolescent risk behaviors would be particularly valuable, especially in an era of budget constraints.

Various types of cross-cutting interventions to reduce adolescent risk taking have shown promising results. Parenting interventions exemplify a cross-cutting intervention strategy with the potential to affect a variety of adolescent risk and protective behaviors and associated health outcomes. These parenting interventions may focus on a variety of topics ranging from general parenting behaviors and skills to providing specific skills and information for addressing particular health behaviors.

A growing body of literature suggests that parents and other caregivers can continue to have important behavioral influence beyond childhood and well into adolescence.^{15–19} For example, in their review of parenting literature, DeVore and Ginsburg¹⁵ explored the roles of parenting style and family factors, communication, parental monitoring, and supervision as potential protective aspects of good parenting and concluded that these parenting practices can have profound effects on adolescent development. They recommended that future research move toward the design and implementation of interventions to strengthen parenting practices.

DeVore and Ginsburg's¹⁵ literature review, however, relied largely on prospective correlational analyses. Thus the question of whether parenting skills can be taught successfully to and implemented by parents or caregivers to produce the desired protective effects has not been addressed adequately. An emerging body of empirical evidence suggests that interventions focused on parenting behaviors can produce positive benefits for a wide range of adolescent risk-taking and protective behaviors, and longer-term health outcomes. Consequently, the Community Preventive Services Task Force (Task Force) undertook a review of effectiveness of parenting and caregiver-focused interventions on adolescent health.

Healthy People 2020

The intervention reviewed may be useful in reaching several objectives specified in *Healthy People 2020*,²⁰ which outlines the disease prevention and health promotion agenda for the U.S. These objectives identify important preventable threats to health and focus the efforts of public health systems, legislators, and policymakers for addressing those threats. For the first time, *Healthy People 2020* includes Adolescent Health as a separate topic, focusing solely on the importance of adolescent health

Table 1. Summary of selected *Healthy People 2020*²⁰ adolescent health-related objectives

No.	Objective
AH-3	Increase the proportion of adolescents who are connected to a parent or other positive adult caregiver
Injury and violence	
IVP-34; AH-11	Reduce the rate of adolescents and young adult victimization from crimes of violence
IVP-34	Reduce physical fighting
MICH-4	Reduce the rate of adolescent deaths
SA-1	Reduce the proportion of adolescents who report that they rode, during the previous 30 days, with a driver who had been drinking alcohol
Sexual behavior	
FP-9	Increase the proportion of adolescents aged ≤17 years who have never had sexual intercourse
FP-8	Reduce pregnancy rates for adolescent girls
HIV-1;2	Reduce the number of new HIV diagnoses and infections
FP-10;11	Increase condom use proportionally
STD-1;6–9	Reduce proportion of adolescents with STDs
Alcohol, tobacco, and other drugs	
AH-7	Reduce the proportion of adolescents who have been offered, sold, or given an illegal drug on school property
SA-2;3	Increase the proportion of adolescents never using and who disapprove of the use of substances
TU-8	Reduce tobacco use and initiation in adolescents
Mental health	
MHMD-4	Reduce the proportion of people who experience major depressive episode
MHMD-2	Reduce rate of suicide attempts
MHMD-3	Reduce the proportion of adolescents with eating disorders
Chronic disease prevention	
NWS-11	Prevent inappropriate weight gain
NWS-10	Reduce the proportion of children and adolescents who are overweight or obese

AH, adolescent health; FP, family planning; IVP, injury and violence prevention; MHMD, mental health and mental disorders; MICH, maternal, infant, and child health; NWS, nutrition and weight status; SA, substance abuse; STD, sexually transmitted diseases; TU, tobacco use

and behaviors. These Adolescent Health objectives and other relevant topic areas of *Healthy People 2020* are shown in Table 1.

Evidence Acquisition

Conceptual Approach

The review focused on interventions defined by the systematic review development team as “Person-to-person interventions conducted outside of a clinical setting that are intended to modify adolescents’ risk/protective behaviors and health outcomes by improving their caregivers’ parenting skills.” These interventions involve direct, personal contact between intervention staff and caregivers of adolescents to decrease adolescent risk behaviors, increase protective behaviors, and improve adolescent health outcomes by improving caregivers’ parenting behaviors, as shown in the analytic framework (Figure 1).

The desired changes in caregiver’s parenting behaviors are intended to influence the relationship between adolescent and caregiver through improved communication and other relationship dynamics. Examples of these kinds of changes include effective communication dynamics, enhanced nurturing, and initiated discussions about ways to avoid risk behaviors as well as explore alternative activities to replace risk behaviors with protective behaviors. The intervention also may result in the caregiver decreasing the opportunities the adolescent has to engage in risk behaviors, such as through increased monitoring of activities and setting limits.

Some interventions may be designed to initiate multiple changes in caregivers. For example, an intervention could educate caregivers about the dangers of various risk behaviors, provide information on protective behaviors for the adolescent, instruct caregivers on parent–child communication techniques, and provide guidance on steps for monitoring adolescent behaviors. These changes presumably affect risk and protective behaviors in which the adolescent engages, which subsequently affect longer-term health outcomes.

Although the literature typically refers to these types of interventions as “parenting” interventions, for this review the intervention description was broadened to encompass “caregivers,” because many children do not grow up in parent-headed households. A caregiver is seen as a parent or other individual (e.g., foster parent or grandparent) with parenting responsibilities for the adolescent. A person-to-person format was specified in the intervention definition to clarify that some form of direct personal contact was required, differentiating this intervention from those without some kind of personal interactive contact (e.g., pamphlets on parenting, websites, or videos). Examples of person-to-person communication of intervention content include in-class sessions, training provided one-on-one to the caregiver by an intervention specialist, or telephone contacts with the caregiver coupled with information provided through written materials. The interventions may be targeted either to the caregiver alone or to the caregiver and the adolescent.

The recommendation outcomes for this review are adolescent risk and protective behaviors directly linked to intermediate health outcomes (e.g., carrying weapons, smoking, and condom use) and the ultimate health outcomes (e.g., injury or death from weapon use, or pregnancy). These recommendation outcomes were categorized into three categories: engaging in high-risk and protective behaviors; frequency of high-risk behaviors; and health outcomes. Demonstrating linkage between risk and protective behaviors and health outcomes was not required in this framework because many of the outcomes are distal and linkages have been established (e.g.,

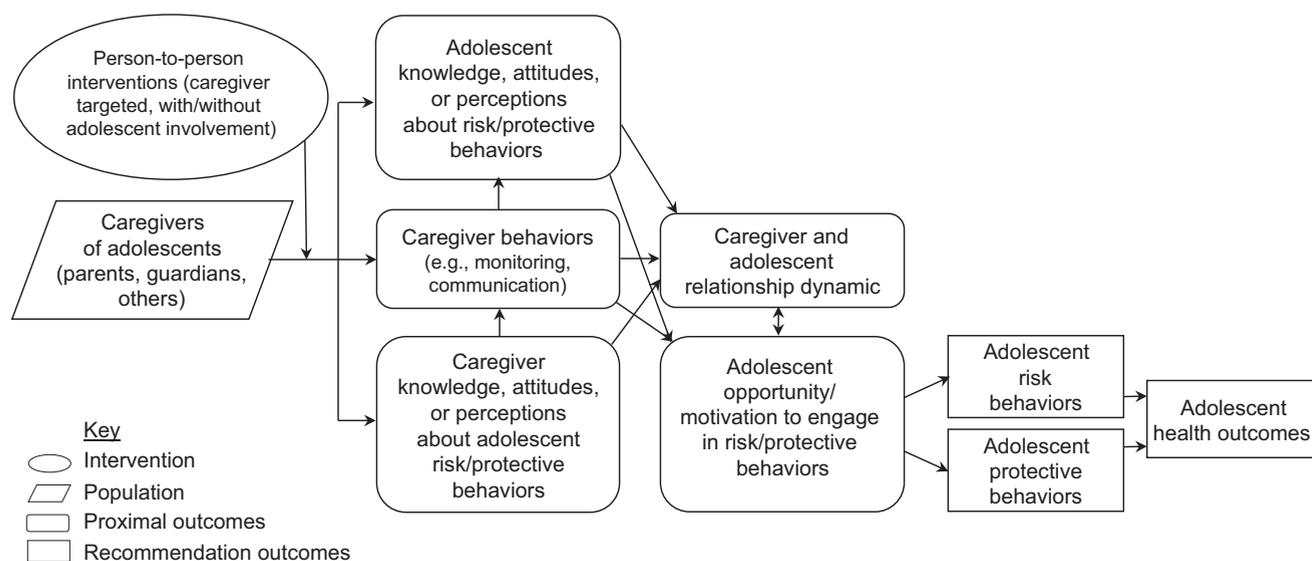


Figure 1. Analytic framework

Note: Framework depicts conceptually how interventions involving direct, personal contact between the intervention staff and the caregiver (referred to as person-to-person interventions) may modify risk and protective behaviors and health outcomes in adolescents by improving their caregivers' parenting behaviors.

smoking is a known risk behavior associated with the longer-term health outcome of lung cancer and other diseases). Further, a person's chances of an undesirable health outcome from engaging in risk behaviors can be ameliorated by practicing protective behaviors. Use of a condom, for example, can mitigate the risks of intercourse.

Methods used to conduct systematic reviews for the *Community Guide* are described in detail elsewhere.^{21–23} As previously noted, the review focus by design was cross-cutting and had the potential to affect multiple types of adolescent risk and protective behaviors and outcomes. A challenge of the review was developing a methodology that could allow aggregation of outcome data from across the multiple behavioral categories, and comparison across interventions. To resolve this, the Coordination Team (the team) drew on the conceptual framing outlined in Jessor's³ Problem Behavior Theory (described above) and used the "problem behavior construct" to develop a conceptually meaningful method for combining the various types of behavioral data. The specific methods used to conduct this review are presented below.

Search for Evidence

Electronic literature searches were conducted by a public health librarian in PubMed, Cochrane, CINAHL, ERIC, SOCIOFILE, and PsycINFO. The team also reviewed references in all retrieved articles, review articles, and systematic reviews and consulted with subject-matter experts to identify additional articles. The initial literature search was conducted in September 2006 and an update search was conducted in August 2007. Keywords for the search were *adolescent, parents, legal guardians, caregivers, mothers, fathers, grandparent, grandmother, grandfather, parent-child relations, health education, patient education, education, risk taking, risk factors, sexual behavior, adolescent behavior, adolescent nutrition, adolescent development, evaluation studies, program evaluation, outcome assessment, risk assessment, process assessment, Internet, therapy, intervention, and person-to-person.*

To be included in this review, articles had to

- be published primary research in peer-reviewed journals, technical reports, or government reports between January 1980 and August 2007 (English only);
- be conducted in a country with a high-income economy^a;
- target caregivers with primary responsibility for the adolescent;
- include adolescents aged 13–18 years at some point in the intervention;
- provide person-to-person interventions in population-based settings in the community that focused on caregiver parenting skills; or
- evaluate change in one or more of the recommendation outcomes (Table 2) or evaluate change in an intermediate risk or protective behavior that would affect a recommendation outcome (e.g., ATOD use).

Nonbiological or nontraditional caregivers, such as foster parents, heads of single-parent families, and same-gender parents, were eligible for inclusion. Special or nontraditional adolescent populations (e.g., delinquent youth, youth with special needs) also were eligible for inclusion. The three outcome categories evaluated to determine the effect of the intervention were as follows: engaging in risk and protective behaviors; frequency of risk and protective behaviors; and health outcomes. The risk and protective behaviors leading to the adolescent health outcomes that emerged from included studies were sexual behaviors; ATOD use; delinquency, violent behaviors, self-harm; driving behaviors; and externalizing behaviors (e.g., physical aggression, verbal bullying, aggression, defiance, theft, and vandalism).

Abstraction and Evaluation of Studies

Each study that met the inclusion criteria was evaluated for suitability of study design and quality of study execution by at least two independent abstractors using the standardized *Community Guide* abstraction form.²¹ Abstractors rated the suitability of each study design as greatest, moderate, or least, depending on the degree to

Table 2. Youth health outcomes

Health outcome category	Health outcomes
Sexual behavior	Reduce number of pregnancies Reduce the number of new HIV diagnoses Reduce proportion with sexually transmitted infections
Violence	Reduce homicides and violence-related injuries
Motor vehicle safety	Reduce deaths caused by motor vehicle crashes Reduce deaths and injuries caused by alcohol and drug-related motor vehicle crashes
Chronic disease prevention	Reduce proportion who are overweight
Mental health	Reduce suicide rate Reduce rate of suicide attempts requiring medical attention

which the design protects against threats to internal validity. They rated the quality of execution of each study as good, fair, or limited based on several predetermined factors that could limit a study's utility for assessing intervention effectiveness. Differences in scoring between abstractors were resolved by consensus of the team. Studies with limited quality of execution were excluded from the final assessment of intervention effectiveness.

Calculation of Effect Estimates

Effect estimates were calculated from qualifying studies when possible using measures of relative percentage change in outcome measures. When CIs were not provided in the primary studies, the team calculated or estimated them if sufficient information was available.²¹ When a study, such as a time-series study, provided multiple measurements over time, the team used the “pre” measurement closest to the start of the intervention and the “post” measurement most distal from the end of the intervention.

The team calculated relative percentage changes in outcomes using the following formula:

$$\left[\frac{(I_{\text{post}}/I_{\text{pre}})}{(C_{\text{post}}/C_{\text{pre}})} - 1 \right] \times 100 \%$$

When studies had a comparison group but did not include a baseline measurement, the following formula to calculate relative percentage changes was used:

$$\left[\frac{(I_{\text{post}}/C_{\text{post}})}{C_{\text{post}}} \right] \times 100 \%$$

Evidence was stratified according to the type of comparison group (i.e., no-treatment, alternative treatment, less-treated). For purposes of this paper, types of comparison groups are defined as follows: (1) *no-treatment*: no treatment is offered; (2) *alternative treatment*: intervention offered is expected to influence behaviors unrelated to behaviors targeted by primary intervention of interest; and (3) *less-treated*: intervention is expected to be relatively less effective than intervention of primary focus. Summary effect estimates were calculated when studies provided a sufficient number of similar outcome measurements for each outcome category.

Qualitative assessment of evidence. In addition to calculating summary effect estimates when possible, a qualitative assessment of the overall body of evidence on effectiveness was conducted to incorporate information from studies that did not report dichotomous outcomes and thus had results not directly comparable with those from other studies. The qualitative assessment considered (1) overall direction and magnitude of effect for all measurements reported in the qualifying studies and (2) limitations in strength of evidence both within individual studies and across the body of evidence.

Meta-analysis to calculate effects across outcomes. Five meta-analyses were conducted using Comprehensive Meta-Analysis software, version 2. The first two meta-analyses estimated the effectiveness of these interventions for reducing the constellation of problem behaviors. To arrive at a single, independent effect estimate from each study, two approaches—“random-effects” and “average-effects”—were used to aggregate results from studies that reported multiple outcomes relevant to the broad “problem behavior” construct.

In the random-effects approach, reported outcomes relevant to the problem behavior construct were treated as independent indices of that construct and aggregated to create a “problem behavior” measure. This was done by calculating a weighted average effect and CI for these indices using a random-effects assumption, under which the expected precision of an effect estimate increases with more observations. In the average-effects approach, these outcomes were treated as if they were completely dependent, and were aggregated by calculating the mean values for both their point estimates and SEs. In this approach, the expected precision of the “problem behavior” effect estimate is unaffected by the number of observations.²⁴

Because effect estimates for different outcomes from a single study are neither completely statistically independent nor completely dependent, neither approach gives totally unbiased results. The random-effects approach will produce CIs that are too narrow because of the failure to account for shared error variance among outcome measures from the same study. In contrast, the average-effects approach will produce CIs that are too wide because of the failure to account for the increased precision that accrues with multiple observations of a construct of interest.²⁵ Thus, the results from each approach can be viewed as two end points of a sensitivity analysis.

Three additional meta-analyses were conducted to examine intervention effects on more discrete sets of behaviors for which there was an adequate sample of studies (sexual activity, violence, and substance use). For these analyses, only the conservative “average-effects” approach to aggregating effects within studies was used.

Evidence Synthesis

Intervention Effectiveness

The literature search identified 16 studies^{16,17,26–39} evaluating the effectiveness of interventions intended to modify adolescents' risk and protective behaviors and health outcomes by improving their caregivers' parenting skills. Of these studies, four^{28,32,33,35} were excluded because of limited quality of execution. The remaining 12

studies^{16,17,26,27,29–31,34,36–39} had fair quality of execution and greatest suitability of study design. Details on study quality scoring criteria are provided at www.thecommunityguide.org/about/methods.html. A list of studies with intervention elements, study population description, effect measures, and results can be found at www.thecommunityguide.org/adolescenthealth/supportingmaterials/SETpersontoperson.pdf.

Study characteristics. Qualifying studies used a variety of intervention strategies and focused on an array of adolescent outcomes. Three elements were common to all interventions in the qualifying studies: an education component, a discussion component, and an opportunity for the caregiver to practice new skills. Specific topics covered in the educational components varied across interventions. Examples of the educational components include: information about communication strategies; recommendations for parental monitoring; and information on more specific topics, such as teen sexual behaviors, along with guidance on how to approach the adolescent with these topics. In the interactive discussion component, the caregiver had the opportunity to discuss the topic and ask questions of a trained individual associated with the intervention. The component providing opportunities to practice learned skills included activities such as completing homework assignments or role-playing activities.

Overall, outcome measures reported were categorized as (1) engaging in high-risk and protective behaviors; (2) frequency of high-risk behaviors; and (3) health outcomes. Of those studies qualifying for final assessment, seven studies^{16,26,29,30,34,37,39} provided outcomes on sexual behaviors, with two studies reporting a health outcome (pregnancy). Seven studies^{16,27,31,34,36,38,39} reported on ATOD use; four studies^{16,34,38,39} reported on delinquency, violence, self-harm, and suicide; one study¹⁷ on driving behaviors; and one study³¹ on externalizing behaviors.

Sample characteristics. Of the included studies, nine^{16,17,26,27,29,30,34,36,37} reported information on race or ethnicity. In three^{17,27,36} studies, >50% of participants were white; in four^{29,30,34,37} studies, >50% of participants were African American; and in one¹⁶ study, >50% of the participants were Hispanic. In addition to depicting the diversity of groups represented in this review, this analysis also demonstrates that samples in these studies are disproportionately inclusive of minority groups when compared with distribution in the general population. Additionally, the median age for the sample (based on the mean age of the participants at baseline) was 12.5 years (range of values: 11.3 to 16.0 years), and the median sample size at follow-up was 355 participants (range of

values: 165 to 1135 participants, reported in 11 studies).^{16,17,26,27,29,30,34,36–39}

Qualitative assessment of evidence. Effect estimates for risk behaviors are shown in Figure 2.^{16,27,29,30,34,37–39} Most results indicate that the intervention reduced adolescent risk behaviors and increased protective behaviors. The results for health outcomes (teen pregnancy) also were in a favorable direction. Because of the heterogeneous set of risk and protective behaviors included, a pooled effect estimate was not calculated.

As noted earlier, some outcome data were not included with the effect estimates of risk data in Figure 2 because the data were not dichotomous, and thus, not directly comparable. In summary: Bauman et al.²⁷ conducted an intervention that consisted of mailed materials with person-to-person follow-up and assessed several ATOD outcomes. Among the subset of youth who were current users, the authors found an increase in cigarette use (number of cigarettes smoked in past 30 days) and alcohol use (number of alcoholic beverages consumed in past 30 days). In the total sample, however, findings indicate beneficial effects for the intervention on ATOD outcomes, although differences were not significant. Using a curriculum to help parents learn communication skills, Park and colleagues³⁶ found that alcohol use increased significantly more slowly for intervention youth compared with control youth ($p < 0.05$). Usage was measured as a combination of use and amount consumed.

Rotheram-Borus et al.¹⁶ conducted a study in which parents with AIDS and their adolescent children participated in an intensive intervention to improve behavioral outcomes. Reported outcomes at 3-month intervals over 6 years on a subset of individuals who were sexually active revealed a lower mean number of sexual partners among youth in the intervention group, although the difference was not significant.

In a study employing caregiver- and adolescent-focused strategies with high-risk adolescents, Dishion and Andrews³¹ used two study arms—a parent-only arm and a parent-and-child arm—to assess changes in adolescents' school and home behavior (as measured by the Child Behavior Checklist). The Aggressive and Delinquent Behavior subscales were lower among intervention adolescents in both arms of the study. Additionally, tobacco use decreased (although not significantly; $p = 0.20$) among adolescents in the parent-only condition compared to youth in the control condition. There was, however, a significant increase ($p < 0.05$) in tobacco use among adolescents in the parent-and-adolescent condition compared to controls.

Finally, in an intervention using a safe driving video and a parent–teen driving agreement provided to par-

ents, Morton and colleagues¹⁷ used three variables to rate caregiver-imposed limits on risky teen driving behaviors. Limits on teen passengers were assessed by self-reports of how many teen passengers were allowed when the teen drove. Week-night and weekend night restrictions were assessed by asking the teens how late teens were allowed to drive. The intervention adolescents reported stricter limits on the number of teen passengers, and on weeknight and weekend night driving curfews; all results from teen reports favored the intervention ($p < 0.001$).

Meta-analyses. Figure 3 presents the results of the meta-analysis that used the random effects approach to aggregate the data from the individual problem behavior outcomes within each study. As discussed above, this approach produces CIs that are overly narrow.

The results in Figure 3^{16,27,29,30,34,37–39} are stratified by type of comparison group: “no-treatment” and “alternative-treatment” combined in one category versus “treated” comparison group. The summary effect estimate is a risk ratio (RR) of 0.82 (95% CI=0.72, 0.94) for studies with untreated or alternative treatment comparison groups. This reflects an 18% relative decrease in problem behaviors. One study in the treated comparison group assessed unprotected sex and produced an RR of 0.27 (95% CI=0.12, 0.59), reflecting a 73% reduction relative to the comparison group.³⁰ Despite the large effect in this study,³⁰ including it with the others did not dramatically affect the overall mean summary effect estimate (RR=0.78, 95% CI=0.66, 0.91).

The I^2 for this analysis is 74%, which indicates substantial heterogeneity (above that expected by sampling variation) in overall results from different studies. This value is likely to be inflated because of the overly narrow CIs produced by the random-effects approach to aggregating within-study results, which would underestimate the expected variation due to sampling error.

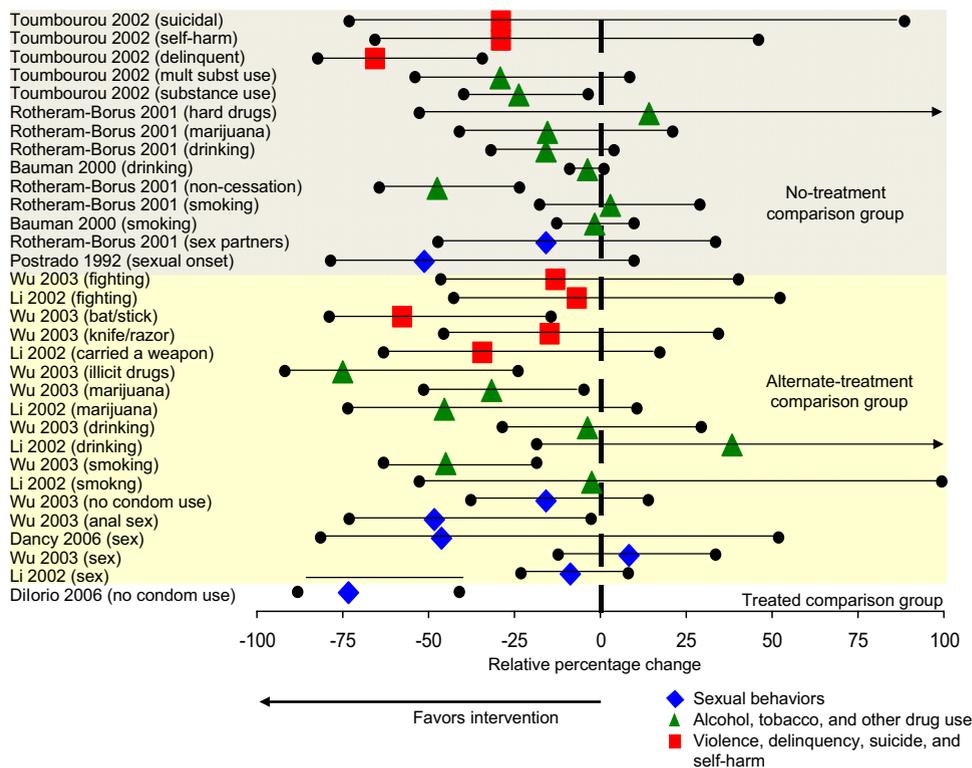


Figure 2. Relative percentage change among risk behaviors stratified by type of comparison group^{16,27,29,30,34,37–39}
mult subst, multiple substance

Figure 4^{16,27,29,30,34,37–39} presents the results of the meta-analysis that used the average effects approach to aggregate the data from the individual problem behavior outcomes within each study. The stratified results for no- or alternative-treatment comparisons produce an RR of 0.84 (95% CI=0.70, 1.01), with an I^2 of 22%. When the treated control study³⁰ is included, the overall mean effect estimate is substantially reduced (RR=0.69, 95% CI=0.52, 0.92), representing a 31% estimated decrease in problem behaviors. Inclusion of this study increases I^2 to 59%, indicating substantial between-study heterogeneity.

The summary effect estimates from meta-analyses of measures of sexual behavior and violence were RRs of 0.69 (95% CI=0.50, 0.94) and 0.68 (95% CI=0.49, 0.94), respectively, reflecting an approximate 30% reduction in these risk behaviors. The effect estimate for measures of substance use indicated a much smaller decrease of 13%, which was nonsignificant (RR=0.87, 95% CI=0.73, 1.04). The I^2 for the sexual behavior meta-analysis indicated a substantial amount of between-study heterogeneity ($I^2=56%$).

The data for substance use were disaggregated further by stratifying on type of substance use: smoking, drinking, and illegal drug use. The overall mean effect estimate is largest for illegal drug use (RR=0.69, 95% CI=0.53,

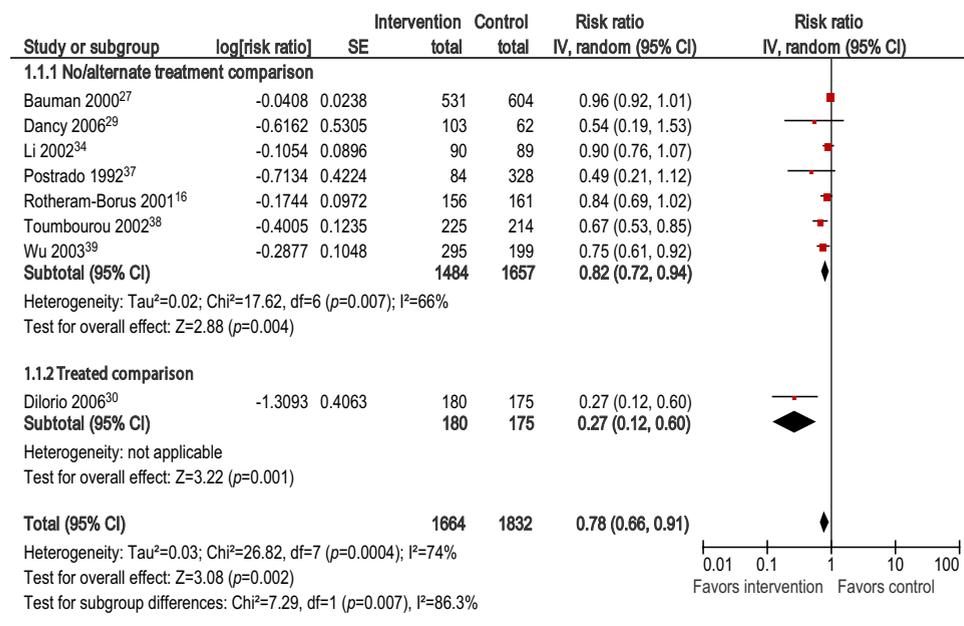


Figure 3. Meta-analysis results using the random-effects approach

Note: Data are aggregated from individual problem behavior outcomes within each study. Results are stratified by type of comparison group.

0.91), indicating a 31% reduction in these outcomes. For smoking, results indicate a smaller and nonsignificant 21% reduction (RR=0.79, 95% CI=0.59, 1.06); the effect estimate for drinking is even smaller (RR=0.95, 95% CI=0.88, 1.03), corresponding to a nonsignificant 5% reduction. The I^2 of 69% for smoking indicates a substantial amount of between-study heterogeneity for that substance use outcome.

Overall, the summary RRs from meta-analyses of problem behavior outcomes are generally around 0.80, representing about a 20% decrease in the composite estimates of problem behaviors. The results from studies that could not be included in the meta-analyses are mostly in the favorable direction and thus support meta-analytic findings.

Applicability

All but one³⁸ of the studies were implemented in the U.S. Studies were conducted in a variety of settings including communities ($n=8$),^{16,17,29–31,36,37,39} homes ($n=2$),^{27,34} schools ($n=2$),^{36,38} or a combination of community and school ($n=1$)²⁶ or community and home ($n=1$).³⁹ Six studies^{16,17,26,29,30,39} were located in urban or suburban areas and one³⁶ in a rural community. Two studies^{29,37} included only women. Targeted populations included majority white ($n=3$),^{17,27,36} majority African-American ($n=3$),^{29,30,34} and majority Hispanic ($n=1$).¹⁶ Some studies were conducted with unique populations (e.g., parents of children with AIDS) and others were more representative of the general population.

Given the variety of settings and populations in the body of evidence, these results should be applicable to diverse settings and populations, provided appropriate attention is paid to adapting the intervention to the target population. It should be noted, however, that caregivers participating in the included studies were volunteers who were sufficiently motivated to attend and participate in a caregiver intervention. Whether similar results would be obtained with a general population of caregivers who may be less motivated or differ in some fundamental way from those participating in included studies is still unknown.

Other Positive or Negative Effects

Additional benefits of this intervention include improvements in the proximal outcomes, such as improved caregiver–child communication,^{17,30,39} which may lead to long-term improvements in other outcomes, such as improved school performance. Youth participating in these interventions also reported an increase in refusal skills³⁶ and self-efficacy for avoiding risk behaviors.²⁹ Benefits also were reported for adolescents who did not directly participate in the intervention.

For example, Tombourou et al.³⁸ reported an analysis of “best friend” dyads, which showed improvements in family relationships and subsequent substance use reduction among respondents whose “best friend’s” caregivers had participated in the intervention. This reduction was hypothesized to occur both as a result of relationships among the youth and communication among caregivers. Although not specifically measured in included studies, another positive benefit may be that caregivers can apply the knowledge, skills, and tactics learned from the intervention to siblings or other children in their household.

A negative effect discussed in included studies focused on the potential for negative outcomes when adolescents congregated in the intervention setting without caregivers present. In these cases, youth who engage in risk behaviors may adversely influence youth who do not engage in the behaviors. Dishion and colleagues,³¹ for

example, reported higher levels of tobacco use and increased teacher reporting of behavior problems for youth congregated in the intervention setting compared with youth in other conditions. Based on these results, these authors concluded that it may be inadvisable to place high-risk youth together in groups, particularly without directly involving caregivers in the setting.

Economic Efficiency

Our search did not identify any economic evaluations of interventions intended to modify adolescents' risk and protective behaviors and health outcomes by improving their caregivers' parenting skills.

Barriers to Intervention Implementation

A potential barrier to caregiver interventions centers on challenges of recruiting and retaining caregivers, particularly those parenting at-risk youth, for the intervention. Caregivers typically face myriad challenges and demands, and their ability to participate in interventions may be limited because of time, transportation, childcare, or other constraints.

Conclusion

According to *Community Guide* methods,²² there is sufficient evidence to indicate that person-to-person interventions intended to modify adolescents' risk and protective behaviors by improving their caregivers' parenting skills are effective in reducing adolescent risk behaviors. These interventions are conducted by some form of direct personal contact (e.g., face-to-face or by telephone) and occur outside of clinical settings. Although there are enough studies of acceptable quality in this review to potentially constitute strong evidence of effectiveness, the substantial amount of heterogeneity in both intervention implementation and outcome measures adds enough uncertainty to the findings to warrant a more cautious conclusion.

Research Issues

Although caregiver-targeted interventions implemented through a person-to-person format are effective

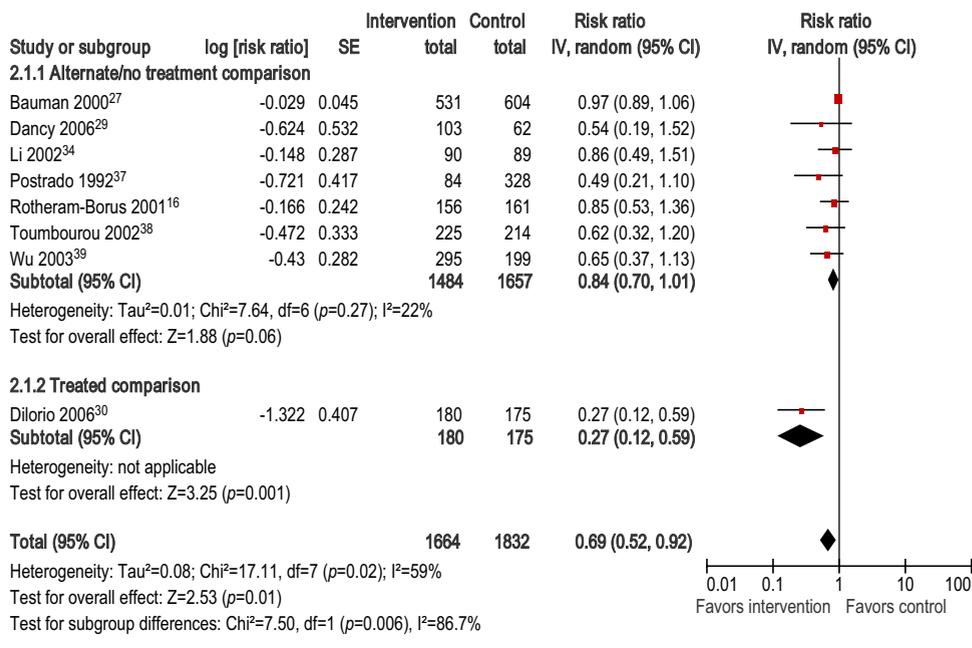


Figure 4. Meta-analysis results using the average-effects approach

Note: Data are aggregated from individual problem behavior outcomes within each study. Results are stratified by type of comparison group.

tive for modifying adolescent risk and protective behaviors, a number of research issues still remain. The following are examples in which further investigation is needed:

- What types of person-to-person formats lead to the greatest effectiveness in adolescent health outcomes?
- What types of caregiver behaviors, if changed, can lead to the greatest reduction or improvement in adolescent risk-taking behaviors?
- For what types of caregiver are these interventions most effective? As noted, the caregivers in these included studies were sufficiently motivated to participate. Questions remain as to whether this intervention would work consistently well across all caregiver types. Specifically, are there types of caregivers for whom caregiver interventions will have no appreciable effect overall?
- Are certain types of caregiver-targeted interventions more effective in creating change for certain risk or protective behavior outcomes than others? Are there types of risk behaviors on which these interventions have only a minimal effect?
- How does the “problem behavior” construct hold up in terms of behavior changes within adolescents? For example, if one risk behavior changes for an adolescent, how likely are other risk behaviors to be affected?
- Once caregivers have received a targeted intervention, can they successfully extend the behaviors and skills to other children, so that potential benefits can be derived for those adolescents as well?

- Is there an optimal age of the child at which, or by which, a caregiver needs to have received the intervention to achieve the desired effects?

• What is the economic cost for these types of interventions? Further research is encouraged to address these and other important topics related to caregiver-targeted parenting behaviors. Where possible, rigorous research designs can help to unravel these key questions, further extend the available database, and ultimately lead to better, more cost-effective implementation of caregiver-targeted interventions. Additional research on issues related to cost effectiveness of person-to-person parenting interventions could provide useful information for guiding future program development and decision-making.

Footnote

^aCountries with high-income economies as defined by the World Bank are Andorra, Aruba, Australia, Austria, The Bahamas, Bahrain, Barbados, Belgium, Bermuda, Brunei Darussalam, Canada, Cayman Islands, Channel Islands, Croatia, Curaçao, Cyprus, Czech Republic, Denmark, Equatorial Guinea, Estonia, Faeroe Islands, Finland, France, French Polynesia, Germany, Gibraltar, Greece, Greenland, Guam, Hong Kong SAR (China), Hungary, Iceland, Ireland, Isle of Man, Israel, Italy, Japan, Republic of Korea, Kuwait, Liechtenstein, Luxembourg, Macao SAR (China), Malta, Monaco, Netherlands, New Caledonia, New Zealand, Northern Mariana Islands, Norway, Oman, Poland, Portugal, Puerto Rico, Qatar, San Marino, Saudi Arabia, Singapore, Sint Maarten, Slovak Republic, Slovenia, Spain, St. Martin, Sweden, Switzerland, Trinidad and Tobago, Turks and Caicos Islands, United Arab Emirates, United Kingdom, U.S., Virgin Islands (U.S.).

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