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Short communication

Computer-mediated intervention to prevent drug abuse and violence among high-risk youth

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Abstract

This research evaluated a computer-mediated intervention for preventing drug abuse and violence. Research participants were economically disadvantaged youth, defined as early adolescents from households with family incomes below the Federal poverty line. Based on cognitive–behavioral skills approaches shown effective in past research, computer intervention was compared with conventionally delivered intervention in a pretest–posttest, control group design. Outcome findings revealed that youth assigned to the computer or conventional intervention arms achieved more positive pretest-to-posttest gain scores than youth in the control arm on several variables. These variables were: how youth regarded people who used drugs, strategies for avoiding trouble, and ways for controlling their tempers. One item, the ability to refuse drug offers, favored youth in the conventional intervention arm over those in the computer or control arms. Combined with prior work on computer-delivered interventions, data from this study lend added support to the viability of computer approaches for preventing drug abuse, violence, and other problem behavior among early adolescent youth.

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1. Introduction

Drug abuse and violence threaten the health of too many American youth. Particularly at risk are young people from economically disadvantaged backgrounds. Despite well-intentioned efforts, investigators have yet to find theory-grounded, empirically tested approaches to prevent drug use and violence among at-risk children. Fortunately, recent

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years have seen progress on developing innovative strategies for prevention program delivery to reach, attract, and aid high-risk youth. One novel approach is the use of interactive computer software. Though few reports exist on computer-based interventions directed at violence or substance abuse, several programs have addressed health topics that include one of these outcomes (Bosworth, Espelage, & DuBay, 1998; Gropper, Liraz, Portowicz, & Schindler, 1995; Schinke, Moncher, & Singer, 1994; The Coolien Challenge, 1998).

2. Method

2.1. Design and sample

We recruited a sample of adolescents residing in households with incomes below the Federal poverty line from 12 community sites in New York City. Study sites included neighborhood centers, clubs, and outreach, recreational, and after-school programs. Randomly, sites were divided into three arms: computer intervention, conventional intervention, and control. At each site, informed and consenting youth were pretested. Youth assigned to the control condition received no intervention. Following intervention delivery, all youth were posttested.

Of the total sample of 189 youth, 64, 65, and 60, respectively, were in computer, conventional, and control arms. Youth ranged in age from 7 to 15 years, with a mean of 9.6 years (S.D. = 1.2 years). Each arm had approximately equal distributions of female and male adolescents. The sample was predominately African American (54.3%) and included fewer Caribbean American (18.4%), Hispanic (17.9%), Asian (5.2%), and nonminority youth (3.3%), with slightly less than 1% of youth defining their ethnic-racial group as “Other.” Analyzed among study arms, ethnic-racial distributions were similar.

2.2. Intervention

Computer intervention content was based on focus group data and reflected salient theory (Botvin & Schinke, 1997; Feindler & Ecton, 1986; Schinke & Botvin, 1999). Written content for drug abuse and anger control content was programmed into a format for Internet delivery. The software taught youth drug abuse prevention and anger control components within the context of a four-step problem-solving sequence. In its entirety, the software contained 20 min of content. Prompts, options, and branches let youth move through the material at their own pace. A menu-driven sequence of screens allowed youth to interact independently with the content while staff rotated among them, offering assistance and instructions.

Conventional intervention covered the same content as computer intervention. Whereas youth in the latter arm interacted with software, youth in the former arm learned drug abuse and violence prevention content through role plays with peers and under the guidance of

community site staff. Youth observed demonstrations of problem-solving skills and completed workbook exercises on intervention content.

2.3. Measures

Youths completed outcome measures on written forms identified with confidential code numbers. Research staff not involved in intervention delivery read each question aloud and illustrated how to select a response. The outcome measure presented 21 statements regarding substance abuse and anger control attitudes, behaviors, and strategies. Subjects indicated on a Likert scale how true each statement was for them. Pretest measures were completed prior to intervention. Posttests were completed immediately after intervention delivery. Obtained over a 2-week period, reliability data on the outcome measurement battery revealed a test–retest coefficient of .87.

Table 1
Gain scores for computer, conventional, and control arms

Questionnaire item	Computer		Conventional		Control	
	M	S.D.	M	S.D.	M	S.D.
<i>Attitudinal scale</i>						
Drugs, alcohol, fighting are trouble	8.8	(3.6)	9.3	(3.6)	5.3	(6.2)
Some of my best friends smoke	7.1	(4.1)	7.4	(3.7)	8.1	(5.2)
People who use drugs are cool	1.4 _a	(1.8)	0.7 _a	(1.4)	− 5.9 _b	(3.1)
I like to get drunk	0.9	(1.5)	− 0.1	(0.9)	− 1.2	(4.0)
I like drugs	0.3	(0.3)	0.2	(1.1)	− 1.5	(2.8)
<i>Behavioral scale</i>						
I smoke cigarettes	0.6	(0.7)	3.9	(2.0)	− 2.5	(2.9)
I say no to cigarette offers	1.9	(1.9)	8.7	(3.4)	3.7	(5.9)
I say no to drug offers	3.5 _b	(2.9)	16.2 _a	(4.5)	− 2.1 _b	(7.5)
I plan to get drunk	2.1	(1.5)	3.7	(2.4)	2.6	(3.7)
I plan to smoke	0.1	(1.3)	4.7	(1.6)	3.0	(2.9)
I plan to do drugs	0.3	(0.6)	0.8	(1.5)	− 2.4	(3.7)
<i>Strategies scale</i>						
Walking away avoids trouble	3.1	(3.4)	7.6	(3.8)	− 0.4	(4.6)
Changing subject avoids trouble	23.4 _a	(4.7)	23.8 _a	(4.5)	4.1 _b	(5.7)
Dissing someone calms me	21.5 _a	(4.1)	22.5 _a	(4.3)	5.1 _b	(6.5)
Picturing future will avoid trouble	8.9	(3.6)	14.2	(3.6)	5.9	(5.4)
Suggest alternative avoids trouble	17.6 _a	(3.7)	16.7 _a	(4.3)	2.4 _b	(5.6)
I stay cool when mad	36.7 _a	(4.5)	34.6 _a	(4.7)	− 0.7 _b	(6.5)
Putting someone off avoids trouble	29.8 _a	(4.3)	24.8 _a	(4.7)	− 13.2 _b	(6.8)
Better decisions if I think ahead	1.6	(3.2)	8.4	(3.2)	4.5	(4.4)
Consider options when pressured	4.7	(3.4)	3.8	(3.2)	2.1	(4.6)
Consider options when deciding	3.4	(2.7)	4.4	(3.3)	− 0.7	(5.2)

Larger scores indicate more positive pretest-to-posttest changes. Row means with dissimilar subscripts differ by Scheffé post hoc comparisons at $P < .05$.

3. Results

Within each arm, outcome data were aggregated across youth and sites. Scoring was reversed for items on which positive change was manifest by a lower, or more negative, change score. Analyses of pretest data revealed no outcome differences within or among sites. Posttest data were subjected to analyses of covariance, with pretests as covariates. Means with significant omnibus F ratios were contrasted with Scheffé post hoc comparisons. Table 1 presents pretest-to-posttest gain scores for youth in each of the three arms on measured attitudinal, behavioral, and strategies scales.

Youth who received computer or conventional intervention realized more positive outcomes than control arm youth on whether they regarded people who used drugs as “cool” [$F(2,185)=3.59, P<.05$], the advantages of changing the subject to avoid trouble [$F(2, 185)=3.03, P<.05$], the inadvisability of “dissing” (insulting) someone to calm oneself [$F(2, 185)=3.26, P<.05$], the advantages of suggesting alternatives to avoid trouble [$F(2, 185)=4.39, P<.025$], the ability to stay cool when angry [$F(2, 185)=3.63, P<.05$], and appropriate ways of putting someone off to avoid trouble [$F(2, 185)=4.99, P<.01$]. On one item, the ability to say “no” to drug use offers, the conventional intervention arm youth scored more positively than computer or control arm youth [$F(2, 185)=3.78, P<.025$].

4. Discussion

Data from this modest study indicate that computer and conventional interventions were superior to no intervention in positively changing poor youth’s perceptions of essential elements in their ability to avoid problems with drugs and anger. Because interactive computer intervention demanded fewer delivery resources and appealed more to youth than conventional intervention, study results suggest the viability of using software to deliver drug abuse prevention and anger control intervention to economically disadvantaged youth.

The study has a number of limitations. Because of the brief intervention, attitudinal or behavioral outcomes were unlikely. In addition, the differential attention to given youth in both intervention arms may have contributed to study outcomes as much as computer and conventional intervention content per se. The self-report nature of outcome findings, a problem in drug and alcohol abuse prevention research, was no less troublesome in this investigation. A small sample size, intracluster correlations among youth in nested sites, wide age ranges, and lack of national representativeness in ethnic-racial backgrounds further limit the generalizability of study findings.

Despite its limits, the study advances the nascent science of computer-delivered prevention programs. That both intervention delivery methods had about the same impact on youth lends support to further work on computer modes for disseminating prevention content on substance use and anger control to high-risk youth. Compared to conventionally delivered health education interventions, the computer mode of delivery can cost less, is more portable, and may achieve greater consistency of implementation. Our study strengthens other work on computer-mediated approaches to health behavior change among youth. Going beyond that

work, however, the study engaged a poor sample and addressed target problem behaviors that have not been previously subjected to careful research. As such, this research gives needed impetus to additional studies of computer-delivered interventions for changing child and adolescent health behavior.

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