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Original article

The complex business of adapting effective interventions to new populations: An urban to rural transfer

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Abstract

Purpose: To assess the effectiveness of a relatively unaltered version of a sexual risk reduction intervention previously shown to be effective among urban youth, "Original Focus on Kids" (OFOK), compared with a version modified for West Virginia (WVFOK) and a control condition (training in environmental conservation), in altering protective sexual behaviors and perceptions among rural, Appalachian youth.

Subjects: Nine hundred ninety-nine youth aged 12 to 16 years from 12 rural counties in West Virginia.

Method: Randomized, controlled, longitudinal trial of a theory-based prevention intervention. Outcomes were self-reported sexual behaviors and perceptions assessed at baseline, 3, 6, and 9 months postintervention.

Results: Both WVFOK and OFOK positively affected perceptions of abstinence but not behaviors. OFOK significantly enhanced some perceptions of condom use compared with both control youth and WVFOK youth, but again, not behaviors.

Conclusions: Overall, neither version was as effective as FOK had been in the original urban setting. The less altered version (OFOK) was more effective, especially with regard to condom-use perceptions, in this new population and cultural setting than the more culturally altered version (WVFOK). In several of the implementation settings, neither version was delivered as intended by the researchers because of logistic issues. Although many of these changes were seemingly minor, such deviations may have significant impact on intervention effect.

Keywords: Rural health; Prevention intervention; Sexual risk behaviors; Diffusion; Abstinence

Among the more vexing issues facing researchers and public health professionals interested in effecting purposeful behavioral change among adolescents has been the tailoring of successful interventions to new settings [1–5]. Adolescent behavioral change research has advanced substantially during the past two decades [6–10]. Central to the maturation of this field of inquiry has been the acceptance of several standards of intervention design. Interventions should be theory based, developmentally and culturally appropriate, and relevant to the epidemiology of the target population. Intervention evaluation should be outcomes-

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based assessed, ideally through a randomized, controlled format, but at a minimum using a quasi-experimental design [6–12].

Adolescent prevention intervention research is therefore expensive. As a result, it is highly desirable to export and replicate interventions demonstrated to be effective in one setting and/or target population to new settings and/or audiences. This public health strategy has served as the basis for national and international replication efforts, including the Center for Disease Control's "Replicating Effective Programs" [13,14] and former "Programs that Work" [15,16], and many lists of effective programs including "Program Archives on Sexuality, Health, and Adolescence," "Effective Curricula and Their Common Characteristics," "School Health Education Clearinghouse," and "UNAIDS: Best Practices Program" [17–20]. These programs and lists are dedicated to identifying successful interventions and increasing their availability throughout the nation and/or the world [13,21].

As important as such replication efforts are, they raise concerns regarding the importance of cultural, developmental, and epidemiological tailoring. Put simply, if an intervention had been designed in response to specific population characteristics or a geographic niche, can this intervention remain effective with no or minor adjustments in a setting whose profile differs among one or more of these characteristics? For example, one adolescent prevention intervention, "Focus on Kids" (FOK) [22,23], was developed for and found to be effective among African-American youth living in and around urban public housing in Baltimore, a city with among the highest rates of STDs and HIV in the country [24,25]. The development phase for this intervention program lasted for 2 years and included extensive ethnographic "participant-observation" activities, individual and group interviews, cue-sorts, and a community-based cross-sectional survey regarding behaviors, perceptions, and knowledge [22,26]. The resultant draft intervention was pilot-tested and revised before implementation and evaluation [26].

Appearing on many lists of effective programs, FOK has been replicated in settings throughout the United States. Consistent with the replication training recommendations by educational experts [23], but in marked contrast to the extensive developmental activities described above, the published FOK curriculum recommends that potential new users of the curriculum "make minor adaptations to best suit the needs of your targeted community" ([23], p. 7) . Left unanswered in these efforts is whether extensive (and potentially expensive and time-consuming) cultural and developmental adaptations of interventions are necessary before their introduction among different populations in new geographic settings. Or, are minor adaptations (which presumably require fewer resources and less time) sufficient after an intervention has been shown to be effective? Accordingly, in this trial we sought to determine whether an intervention designed for and shown to be effective among urban African-American youth aged 9 to 15 years residing in a low-income urban mid-Atlantic setting with high rates of HIV/STDS [24,25] would be effective among primarily Caucasian, Appalachian youth aged 12 to 16 years living in rural settings with low rates of HIV/STDs [25] after minor adaptations only ("Original Focus on Kids" [OFOK]) and/or after significant cultural and epidemiologic alterations ("West Virginia Focus on Kids" [WVFOK]).

Materials and methods

General

Setting. This randomized, controlled, longitudinal trial was conducted among 1131 youth recruited from community (n = 422, 37%) and school (n = 709, 63%) settings in 12 counties from among West Virginia's 55 counties. Youth were randomized at the level of the recruitment group (n = 97 groups) to one of four conditions, including three versions of FOK (OFOK and WVFOK, which were delivered in a face-to-face format and a version delivered by long-distance television) and one control condition delivered in a face-to-face format. A site (e.g., a school or a community recreation center) typically hosted more than one recruitment group (e.g., a classroom or recreation group) and thus included more than one intervention assignment. So, for example, in a single school, youth in one class might receive OFOK, whereas youth in another class might receive WVFOK, etc. In a prior report [27], we demonstrated that youth receiving one of the three versions of FOK (combined to a single group), compared with youth receiving the control, expressed more protective perceptions of sexual risk and protective behaviors. For the present analyses, we are contrasting the specific FOK face-to-face versions against each other and against the control. Therefore, the 132 youth who were randomized to receive the interactive television version have been removed from the dataset. Thus, the analyses in this manuscript are restricted to the 999 youth who were randomized to receive a face-to-face intervention (e.g., 253 OFOK, 485 WVFOK, and 261 control youth).

To conduct the interventions and deliver the assessment questionnaires to the dispersed settings located throughout the highly mountainous terrain of West Virginia [28], 53 different interventionists and 21 different interviewers were required. In each site, day-long training for the interventionists and half-day training for the interviewers were conducted by the central FOK research team. Central FOK staff participated directly in intervention delivery and/or questionnaire collection in some sites and/or conducted spot checks across other sites.

Participants. Youth were aged 12 to 16 years and were identified by community facilitators through local community organizations and/or through the school systems. After receiving an explanation about the program, interested

youth were given materials describing the project and assent and consent forms for their parents. The research protocol was approved by the Institutional Review Board at West Virginia University.

Guiding model of behavioral change

Consistent with other effective adolescent risk prevention programs [6,10], FOK is based on a guiding model of behavioral change, Protection Motivation Theory (PMT) [29]. PMT proposes that environmental and personal factors combine to create a potential health threat that initiates two cognitive pathways, the Threat-Appraisal pathway and the Coping-Appraisal pathway. The perceived Intrinsic and Extrinsic Rewards associated with the risky behavior minus the perceived Severity of and Vulnerability to the threat(s) associated with the risky behavior are evaluated through the Threat-Appraisal pathway. The perceived ability to avert the threatened danger (including both Self Efficacy and Response Efficacy) balanced against the Response Cost are evaluated through the Coping-Appraisal pathway. Together the two appraisal pathways produce Protection Motivation, which, if high enough, may result in protective action.

Description of intervention and control conditions

The FOK intervention, described in detail in several publications [22,23,26], is an 8-session (each approximately 1.5 hours) risk reduction intervention that emphasizes decision-making, goal-setting, communication, negotiating, consensual relationships, and information regarding abstinence and safer sex, drugs, alcohol, and drug selling. Intervention format includes games, discussions, homework assignments, videos and a story about a hypothetical family that appears in nearly all of the sessions to contextualize decision-making and choices.

Cosmetic modifications were made by the West Virginian researchers to FOK to produce OFOK before the ethnographic work undertaken to produce WVFOK. Alterations included changing the names of members of the story family used to illustrate problem-solving and decision-making and inserting West Virginia rates of STDs for the games designed to demonstrate transmission of STDs. After these initial modifications, additional changes were requested in some communities (e.g., the condom-search homework assignment was rejected across all communities, the condom demonstration was not permitted in two communities, and the condom race was not permitted in six communities.)

The "culturally adapted" version, WVFOK, was developed specifically for West Virginia based on focus group discussions and individual interviews conducted among West Virginian youth, parents, teachers, and school and community administrators, and data obtained from risk prevalence studies conducted in West Virginia [28]. Consistent themes emerging from these discussions were anxiety about the limited economic opportunities available to youth and a preference for a stronger emphasis on abstinence. Among some parents and in some communities, there was substantial concern regarding the display of condoms and discussion of protected sex. Accordingly, in addition to the changes made in FOK to produce OFOK, further modifications made to produce WVFOK included omission of the condom race, substantial changes in the characters and the story line regarding the hypothetical family, the addition of factual information regarding STDs, more discussion of abstinence, and a specific emphasis on the future, including the addition of two exercises regarding goal setting and future planning.

Although the original FOK had been delivered in eight weekly sessions, given the long distances and the lack of transportation, for the community-based settings this approach was not feasible. Instead, the program was delivered in one day-long session or two half-day sessions for community-based settings (n = 300 youth), but retained the original eight-session format for most school-based settings (n = 699 youth).

Youth assigned to the control condition (Control) received an environmental health intervention adapted from the Council for Environmental Health's curriculum "Water Education for Teachers" [30]. Of comparable length to FOK, this program was selected for the attention control because it does not include information on interpersonal decision-making, goal-setting, communication, negotiating, or consensual relationships and does not provide information regarding abstinence and safer sex, drugs, alcohol, and drug selling. Length and recruitment strategies were comparable with the FOK format in any given site. All Control classes were delivered in a face-to-face group format.

Measures

Youth risk behaviors were assessed by youth self-report, using a modified version of the Youth Health Risk Behavior Inventory (YHRBI) [31]. As described elsewhere [27], the YHRBI was modified for West Virginia (WV-YHRBI) based on the findings from qualitative research [28]. The WV-YHRBI assesses demographic characteristics of the youth, and youth involvement in risk/protective behaviors, including sexual intercourse/abstinence and, among sexually active youth, condom use/nonuse in the last sexual encounter and in general, as well as other sexual risk and protective behaviors. Dichotomous responses (0 = No, 1 = Yes) were used for these items. Perceptions of risk and protective behaviors according to the seven constructs of PMT youth are assessed through a five-point Likert scale. (See Table 1 for specific items included.) Consistent with the PMT model, higher scores for perceptions of *Vulnerability* and *Severity* of the adverse outcome(s) of the risk behavior, and *Response Efficacy* and *Self Efficacy* of the protective behavior indicate increased protection. By contrast, the reverse is true for perceived *Extrinsic Rewards* and

Table 1
PMT constructs and items regarding abstinence and condom use among rural West Virginian youth

Constructs and items
Abstinence coping appraisal
Self-efficacy
If I am horny I can't control what happens (1 = "strongly agree" to 5 = "strongly disagree")
Even if all my friends were having sex, I would not feel I have to have sex (5 = "strongly agree" to 1 = "strongly disagree")
I can say no to the person going out with me if I don't want to have sex (5 = "strongly agree" to 1 = "strongly disagree")
Sometimes sex just happens and you really can't control it (1 = "strongly agree" to 5 = "strongly disagree")
I can go with a person for a long time and not have sex with them (5 = "strongly agree" to 1 = "strongly disagree")
Response efficacy
A guy and a girl can go together and not have sex (5 = "strongly agree" to 1 = "strongly disagree")
Response cost
If a girl says she won't have sex, a boy would say Okay (1 = "strongly agree" to 5 = "strongly disagree")
A guy and a girl can go together and not have sex (1 = "strongly agree" to 5 = "strongly disagree")
If a guy says no to having sex, a girl would say Okay (1 = "strongly agree" to 5 = "strongly disagree")
Abstinence threat appraisal
Extrinsic rewards
I want kids my age to think I am having sex (5 = "strongly agree" to 1 = "strongly disagree")
I want kids my age to think I am a virgin (1 = "strongly agree" to 5 = "strongly disagree")
How many of your close friends have sex? (5 = "Most" 3 = "Some" 1 = "None")
Intrinsic rewards
How you feel about having sex (5 = "very good" to 1 = "very bad")
In the next 6 months, how likely is it that you will become pregnant (get a girl)? (1 = "very unlikely" to 5 = "very likely")
Condom use coping appraisal
Self efficacy
I could get condoms (5 = "strongly agree" to 1 = "strongly disagree")
I could put a condom on directly (5 = "strongly agree" to 1 = "strongly disagree")
I could convince my sexual partner to use a condom (5 = "strongly agree" to 1 = "strongly disagree")
I could ask for condoms in a store (5 = "strongly agree" to 1 = "strongly disagree")
I could ask for condoms in a clinic (5 = "strongly agree" to 1 = "strongly disagree")
I could ask my sex partner about her/his past sexual relationship (5 = "strongly agree" to 1 = "strongly disagree")
I could refuse sex if the other person will not use a condom (5 = "strongly agree" to 1 = "strongly disagree")
Response efficacy
Condoms are an important way to prevent a pregnancy (5 = "strongly agree" to 1 = "strongly disagree")
Condoms prevent you from getting an STD (5 = "strongly agree" to 1 = "strongly disagree")
Condoms break often (1 = "strongly agree" to 5 = "strongly disagree")
Condoms prevent you from getting AIDS (5 = "strongly agree" to 1 = "strongly disagree")
Response cost
Everyone will find out if I get a condom (5 = "strongly agree" to 1 = "strongly disagree")
If a girl carries condoms, people think she is having sex (5 = "strongly agree" to 1 = "strongly disagree")
Condoms make sex hurt for a girl (5 = "strongly agree" to 1 = "strongly disagree")
Condoms take away the feeling a guy has during sex (5 = "strongly agree" to 1 = "strongly disagree")
Kids don't want other kids to think they are using condom (5 = "strongly agree" to 1 = "strongly disagree")
If my mother knew I was carrying condoms, she would be upset (5 = "strongly agree" to 1 = "strongly disagree")
If my father knew I was carrying condoms, he would be upset (5 = "strongly agree" to 1 = "strongly disagree")
Condom use threat appraisal
Extrinsic rewards
Of the boys you know who have sex, how many of them use condoms? (1 = "Most" 3 = "Some" 5 = "None")
Intrinsic rewards
Condoms make sex feel better (1 = "strongly agree" to 5 = "strongly disagree")
Severity
If one member of a couple gets an STD, they would break up (5 = "strongly agree" to 1 = "strongly disagree")
How would you feel about getting an HIV infection? (1 = "very good" to 5 = "very bad")
How would you feel about getting an STD? (1 = "very good" to 5 = "very bad")
How would you feel getting pregnant or getting a girl pregnant? (1 = "very good" to 5 = "very bad")
Vulnerability
In the next 6 months, how likely is it that you will become infected with HIV? (1 = "very unlikely" to 5 = "very likely")
In the next 6 months, how likely is it that you will get an STD? (1 = "very unlikely" to 5 = "very likely")
In the next 6 months, how likely is it that you will become (get a girl) pregnant? (1 = "very unlikely" to 5 = "very likely")

Intrinsic Rewards of the risk behavior and *Response Cost* of the protective behavior. As described in greater detail elsewhere [27], the alpha value was below .69 for only one of the construct sub-scales (Response Cost) for Abstinence and for two construct sub-scales for Condom use (Response Efficacy and Response Cost). Alpha values exceeded .90 for two construct subscales. All perceptions are specific to either abstinence (sexual intercourse) or condom use (unprotected sex) except Severity and Vulnerability, which have items that are common to both abstinence and condom use.

Administration of questionnaires

The questionnaires were administered by one of two formats: either orally/visually by a talking Macintosh computer (29%) or by a paper-and-pencil format (71%), depending on the desire of the local intervention site. The talking computer methodology is described in greater detail elsewhere [32]. For both options, adults were available to answer any questions and confidentiality of responses was assured. Youth completed questionnaires at baseline (before randomization to intervention assignment), and 3, 6, and 9 months postintervention. The questionnaire required approximately 45 minutes to complete.

Analysis

We assessed baseline equivalence of demographic characteristics using Chi square and Kruskal-Wallis tests among intervention groups and by gender and age, and three potentially confounding "intervention delivery factors," including the number of days over which the intervention was delivered (1 or 2 vs. 4 or 8), method of data collection (pencil-paper vs. computer) and field-level program content (included/excluded the condom demonstration). To adjust for the strategy of cluster (rather than individual) randomization, the intraclass correlation coefficient (ICC) was determined for each behavior and construct subscale score [33]. ICC values ranged from 0 to .097. Baseline differences in behaviors and perceptions between OFOK and WVFOK versus Control were assessed using the General Linear Model (GLM). Adjusted Means (or Estimated Marginal Means) for behaviors and perceptions were calculated at 3, 6 and 9 months, after controlling for age, gender, intervention implementation factors, and corresponding variables at baseline. All F tests and corresponding p values calculated at 3, 6 and 9 months were adjusted for the ICC [34].

Intervention effects on behaviors and perceptions of abstaining/participating in sex (and, among sexually active youth, use of condoms) at 3, 6, and 9 months postintervention were contrasted between WVFOK, OFOK, and Control youth. Finally, analyses were conducted following an "intention-to-treat" model; all youth who were randomized to participate in the trial were included in impact analyses, regardless of intervention attendance/completion.

Results

General

Among the 999 youth randomized to the three conditions, 825 (83%) were present at the 3-month follow-up, 848 (85%) at the 6-month follow-up, and 810 (81%) at the 9-month follow-up. Overall, 891 (89%) of the 999 youth completed the intervention condition to which they had been assigned; 223 (88%) of the 253 youth completed OFOK, 439 (91%) of the 485 youth completed WVFOK, and 229 (88%) of the 261 youth completed the Control conditions.

As shown in Table 2, at baseline, youth assigned to the Control, OFOK and WVFOK conditions differed on the basis of gender, with WVFOK having significantly fewer males (29%) than the Control group (44%), which in turn had significantly fewer than OFOK (76%, $p < .0001$). Although the Control and WVFOK groups were comparable with respect to age (mean age 14.36 years), the mean age of OFOK youth was 14.73 ($p < .05$).

As shown in Table 3, perceptions as measured by the Abstinence and Condom Use PMT subscales differed at baseline by gender and age. Females, compared with males, generally subscribed to more protective views regarding abstinence, with higher perceptions of Self Efficacy and Response Efficacy (to remain abstinent) and lower perceptions of Intrinsic and Extrinsic Rewards (for engaging in sex). Males perceived themselves as more vulnerable to HIV/AIDS than did females.

Among the eight PMT perceptions from the Abstinence and Condom Use subscales, which differed on the basis of age, older youth (15 to 16 years at baseline) compared with younger youth (12 to 14 years at baseline) held more protective views for five constructs. Youth, independent of age and gender, perceived HIV, STDs and pregnancy to be severe outcomes. Perceived Vulnerability was generally low, although younger youth perceived themselves to be more vulnerable than did older youth. After controlling for gender, age, and intervention delivery factors, risk perceptions did not differ by intervention assignment at baseline.

Sexual behaviors also differed at baseline by age and gender. Rates of abstinence in the last 6 months at baseline differed by intervention status, even after correcting for age, gender and intervention implementation factors, whereas rates of condom use were similar after controlling for these factors.

Intervention effect on perceptions

In Table 4, we display the intervention effect (after controlling for baseline perceptions, age and gender, and intervention factors) on perceptions regarding abstinence and condom use. Significant differences between pairs of groups (after adjusting for the ICC) are presented. As shown in the left half of this taber (pceptions concerned with abstinence), WVFOK youth exhibited higher levels of Self Efficacy and Response Efficacy

Table 2
Baseline demographic and intervention delivery factors among 999 West Virginian youth

		Intervention status		
	Overall	Control	OFOK	WVFOK
n (%)	999 (100)	261 (26.13)	253 (25.33)	485 (48.55)
Demographic factors				
Gender				
Male	448 (44.85)	114 (43.68)	192 (76.19)	142 (29.34)**
Age				
12–14 years	449 (45.04)	126 (48.28)	94 (37.30)	229 (47.31)
15–16 years	548 (54.96)	135 (51.72)	158 (62.70)	255 (52.69)*
Intervention delivery factors				
Sessions				
1–2 days	300 (30.03)	100 (38.31)	52 (20.55)	148 (30.52)
4–8 days	699 (69.97)	161 (61.69)	201 (79.45)	337 (69.48)**
Condom demonstration				
Included	92 (9.21)	26 (9.96)	15 (5.93)	51 (10.52)
Excluded	907 (90.79)	235 (90.04)	238 (94.07)	434 (89.48)
Questionnaire Format				
Computer	292 (29.26)	79 (30.27)	75 (29.64)	138 (28.51)
Paper and pencil	706 (70.74)	182 (69.73)	178 (70.36)	346 (71.49)

* $p < .05$; ** $p < .0001$.

and lower levels of Response Cost compared with Control youth with significant differences at 6 months. Abstinence-related perceptions regarding the other constructs did not differ between WVFOK and Control youth. OFOK youth also showed higher perceptions of Response Efficacy and lower perceptions of Response Cost compared with Control youth at 6 months. There were no differences between WVFOK and OFOK youth.

The right half of Table 4 displays perceptions regarding Condom use. WVFOK youth did not differ compared with Control youth regarding any PMT perception at any follow-up period. By contrast, OFOK youth demonstrated significantly higher perceptions of Self Efficacy compared with both Control and WVFOK at 3 and 6 months postintervention.

Perceptions of Severity were higher among OFOK youth compared with WVFOK and Control youth at 3 and 6

Table 3
PMT constructs and protected sex behaviors by age, gender and intervention status at baseline among 999 West Virginian youth

		Gender[a]		Age group[a]		Intervention status[b]		
PMT Constructs	Overall[a]	Male	Female	12–14 years	15–16 years	Control	OFOK	WVFOK
Abstinence								
Self efficacy	3.73	3.51	3.91**	3.68	3.78*	3.70	3.73	3.66
Response efficacy	4.36	4.19	4.49**	4.29	4.41*	4.36	4.35	4.35
Response cost	2.34	2.37	2.32	2.39	2.30*	2.21	2.28	2.27
Extrinsic rewards	2.48	2.65	2.34**	2.23	2.67**	2.44	2.41	2.41
Intrinsic rewards	2.63	2.91	2.40**	2.37	2.83**	2.47	2.52	2.48
Condom use								
Self efficacy	2.27	4.24	4.28	4.12	4.31*	4.18	4.01	4.06
Response efficacy	3.82	3.88	3.78	3.8	3.83	3.93	3.84	3.83
Response cost	2.83	2.75	2.89	2.82	2.83	2.88	2.79	2.98
Extrinsic rewards	2.09	2.00	2.15	2.31	1.97**	1.99	2.03	2.13
Intrinsic rewards	3.79	4.01	3.66**	3.79	3.79	4.03	3.78	3.96
Severity and vulnerability								
Severity	4.29	4.27	4.31	4.29	4.3	4.32	4.27	4.31
Vulnerability	1.45	1.51	1.40*	1.51	1.40*	1.34	1.32	1.31
Protected sex behavior								
Abstinent[c]	.78	.81	.75	.90	.70**	.75	.85	.82*
Condom use[d]	.81	.82	.79	.87	.79	.79	.91	.78

* $p < .05$; ** $p < .0001$.
[a] Adjusted mean, controlling for age, gender and intervention delivery factors.
[b] Abstinent in the last 6 months.
[c] At the last episode of sex.

Table 4
PMT constructs controlled for age, gender, intervention implementation factors and baseline score at 3, 6, 9 months postintervention among West Virginian youth

	Intervention (adjusted means)					
	Abstinence			Condom use		
PMT constructs	Control	OFOK	WVFOK	Control	OFOK	WVFOK
Self efficacy						
3 month	3.80	3.88	3.84	4.31	4.68	4.37[a,c]
6 month	3.64	3.75	3.80[b]	4.28	4.66	4.40[a,c]
9 month	3.74	3.68	3.73	4.44	4.60	4.57
Response efficacy						
3 month	4.16	4.25	4.24	3.78	3.97	3.89
6 month	4.02	4.21	4.22[a,b]	3.63	3.75	3.68
9 month	4.10	4.07	4.11	3.74	3.91	3.82
Response cost						
3 month	2.35	2.26	2.31	2.98	2.71	2.80
6 month	2.44	2.25	2.27[a,b]	2.80	2.54	2.71
9 month	2.33	2.26	2.30	2.90	2.55	2.81
Extrinsic rewards						
3 month	2.55	2.53	2.58	2.04	2.14	1.85
6 month	2.61	2.58	2.59	2.27	2.05	2.02
9 month	2.55	2.51	2.62	2.25	2.25	2.18
Intrinsic rewards						
3 month	2.63	2.51	2.61	3.77	3.57	3.68
6 month	2.48	2.38	2.46	3.82	3.58	3.55
9 month	2.55	2.58	2.41	3.49	3.79	3.47
Severity and vulnerability scales are common for both abstinence and condom use						
Severity						
3 month	4.18	4.38	4.24[a,c]			
6 month	4.18	4.35	4.21[a,c]			
9 month	4.19	4.05	4.22			
Vulnerability						
3 month	1.60	1.53	1.54			
6 month	1.51	1.40	1.62[a,c]			
9 month	1.57	1.68	1.57			

[a] Control vs. OFOK, $p < .05$ (adjusted for ICC).
[b] Control vs. WVFOK, $p < .05$ (adjusted for ICC).
[c] OFOK vs. WVFOK, $p < .05$ (adjusted for ICC).

months. Perceptions of vulnerability were lower among OFOK youth compared with both WVFOK and Control youth at 6 months.

Intervention effect on behaviors

As shown in Table 5, there were no significant differences among behaviors at any of the three follow-up assessments between the two intervention conditions and the Control condition among the full cohort.

Discussion

General

These data, although not strong, are intriguing in their implications that relatively subtle differences in risk reduction interventions can effect sexual risk perceptions. The Baltimore version of Focus on Kids is a "safer sex" intervention; although abstinence is discussed and strongly endorsed, training in appropriate and consistent condom use is also discussed. OFOK was intended to be nearly identical with the Baltimore version. The WVFOK condition, in which the explicit condom-related exercises from FOK were omitted and generic discussions of the potential adverse effects of pregnancy on a youth's future were added, may have resulted in more emphasis on abstinence than was present in OFOK. Both WVFOK and OFOK had an overall positive effect, albeit weak, on perceptions of abstinence. OFOK, but not WVFOK, significantly enhanced perceptions of self-was efficacy with regard to condom use compared with Control youth and even with WVFOK youth. Thus, overall, although neither version was as effective as FOK had been in Baltimore [22], there is some evidence that the less altered version (OFOK) might be more effective in this new population and cultural setting than the more culturally altered version (WVFOK), especially with regard to condom use.

Consistent with the literature indicating that sexual risk reduction interventions have not been shown to increase risk behaviors [6], neither OFOK nor WVFOK was associated with increased risk participation. Moreover, in contrast to the multiple positive changes in perceptions among both OFOK and WVFOK youth, significant negative perceptions were limited to decreased perceptions of Vulnerability among OFOK youth. However, it is unclear if decreased perceptions of vulnerability in a population exhibiting low rates of sexual activity and STDs and high rates of condom use should be regarded as a failure or as a success of the intervention. Given the strong emphasis on skills in OFOK and WVFOK, it is not surprising that OFOK had a relatively stronger effect on self-efficacy regarding condom use and that both versions of FOK afforded some protection with regard to Response Efficacy and Response Cost regarding sexual refusal.

Potential limitations

The differences between the two intervention conditions were less than what we might have originally anticipated. We encountered considerable resistance in many of the communities to the inclusion of condom-related material and thus, despite our intent to include all of the condom-related activities contained in the Baltimore version of Focus on Kids in OFOK, this was not possible in all cases. In some cases these omissions occurred county-wide and were negotiated before intervention implementation was initiated in these settings, and in other instances interventionists became uncomfortable and omitted, substituted or modified the exercises, thus effectively reducing the intended differences between OFOK and WVFOK and our ability to control for all intervention delivery deviations. Second, our approach to culturally adapting FOK to West Virginia included the use of FOK as the basic template followed by adjusting as necessary based on feedback from focus group and individual interviews. However, in constructing the original FOK in Baltimore, we did not begin with any template but rather developed the overall approach after considerable time with the youth in multiple settings. Therefore, the "cultural adaptation" employed in developing this reinvention of FOK was considerably different from the "cultural exploration" employed in the development of FOK. Thus, these data cannot be taken to indicate that a culturally specific intervention developed for West Virginia would be weaker than an intervention developed in another setting. Third, as noted earlier in this manuscript, because of logistical problems in this widely dispersed setting, both versions of the intervention (as well as the Control) often had to be delivered over 1- or 2-day settings, rather than in the eight weekly sessions as originally designed [26]. Evidence suggests that intervention impact is weaker from this format [10,35] Fourth, several of the PMT construct subscales had only one item or a low alpha valve and therefore may or may not be accurately measure the intended domain.

Implications of the findings

In fact, we really were not able to assess our original study question, which sought to contrast the utilization of an intervention without cultural adaptation with one that was significantly altered for the new setting. Perhaps naively, we assumed that communities would be tolerant of ideas considered acceptable in other settings, forgetting that cultural adaptation is not necessarily volitional, but is an intrinsic form of implementation in new settings. Our premise that implementers of "standard" interventions might in fact adhere to the recommendation of "minor alterations" [23] is unfounded. Indeed, consistent with Diffusion Theory [36], Galbraith [37] has found that among 34 agencies that adopted Focus on Kids, all but one of the agencies made some change to the curricula. Across the 34 agencies, the mean number of activities that were changed or deleted was 24.1 (SD = 14.1) out of 53 activities. New activities were added by 18 (53%) respondents. Of respondents who added new activities, the mean number of activities added was 3.85 (SD = 5.87). Re-invention, by allowing customization of the intervention to the communities needs, can be tremendously beneficial to adopters. A national survey of innovations in public school found that when educational innovations were re-invented, institutionalization was more likely to occur and schools were more likely to continue the reinvented programs [38]. But, reinvention results in numerous, unprogrammed curricular changes. To effectively monitor and interpret the effects of such changes requires more intensive process evaluation than might accompany outcomes research in more controlled settings. As we have shown in the present study, these field-based implementation changes do affect intervention impact.

Despite our inability to thoroughly assess the original study question, this work is important, for it suggests that interventions designed for very different settings can retain some effectiveness in new settings, even if the impact is not as strong as in the original community. Thus, OFOK retained considerable effect on perceptions of condom use overall and especially among males, consistent with the original experience in Baltimore [22].

These findings also appear to suggest that seemingly "minor" alterations can produce significant changes in impact. Thus the removal of the Condom Race and the Condom Hunt (and in some settings the Condom demonstration), from WVFOK resulted in an intervention with significantly less impact on condom-related perceptions. On the one hand, a substantial experience with diffusion of new interventions provides evidence that if an innovation is contrary to prevailing norms, it will not be adapted and therefore changes to render it more compatible will be

Table 5
Protected sexual behaviors controlling for age, gender, intervention delivery factors, ICC and baseline means at 3, 6, 9 months post intervention among West Virginian youth

Protected sex behaviors	Overall mean	Intervention status (adjusted mean)		
		Control	OFOK	WVFOK
Abstinence[a]				
Month 3	.73	.75	.71	.73
Month 6	.70	.73	.70	.67
Month 9	.67	.71	.63	.66
Condom use[b]				
Month 3	.74	.59	.65	.54
Month 6	.70	.63	.71	.52
Month 9	.70	.75	.81	.62

[a] Abstinent during the last 6 months.
[b] Condom use at the last episode of sex.

necessary for its utilization [36]. Contrarily, these data suggest that the omission of a few "critical" activities and exercises (in this case related to condoms) are not in fact minor but fundamental alterations in a curriculum. These were the only exercises in FOK in which condoms are handled by the youth. Kelly [39] has suggested that interventions contain "core elements," which if changed will fundamentally disrupt the effectiveness of the intervention. These condom-related activities in which actual condoms rather than pictures or a movie displaying condoms are used may represent such "core elements," consistent with the findings by Robin and colleagues [10] that inclusion of skills practice is critical to successful adolescent intervention programs. The difficulty for individuals attempting to replicate successful interventions in new settings will be in identifying such "core elements" during intervention adaptation and successfully negotiating the at-times competing demands resulting from their incongruence with prevailing norms. Effective monitoring to prevent "drift" and/or to account for further field-based changes will be essential to further our understanding of intervention adaptation.

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