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THE IMPACT OF A HOSPITAL BASED EDUCATIONAL PROGRAM ON ADOLESCENT ATTITUDES TOWARD DRINKING AND DRIVING

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ABSTRACT

The High Risk Adolescent Trauma Prevention Program is situated in a teaching hospital setting, where adolescents who are considered to be high risk-takers tour a shock trauma unit. Results from a pretest-posttest longitudinal evaluation design with 351 adolescent participants indicated marked changes in participants attitudes toward driving after drinking, riding with someone who has been drinking and preventing a friend from driving after drinking. These changes in attitudes are still evident, though with some decline in magnitude, after twelve months.

Most programs designed to educate adolescents about the risks involved in alcohol abuse are based in schools and are designed to be administered to the general population of students rather than to adolescents who are already designated as being at greatest risk of abusing alcohol. These programs have been criticized for influencing knowledge about alcohol more so than related attitudes or actual behaviors and for not resulting in sustained long term effects [1-6].

Among the most serious problems associated with teenage alcohol abuse are vehicular related accidents, with alcohol consumption being a major factor contributing to vehicular accidents involving adolescents [7-9]. The effects of these

accidents are seen not only in mortality rates and in increased medical care costs, but also in diminished long term physiological, psychological, and socio-economic prospects for survivors.

This article assesses the impact of a unique hospital-based program, the High Risk Adolescent Trauma Prevention Program, in its efforts to change adolescent willingness to drive after drinking, to ride with someone who has been drinking or to permit a friend to drive after drinking.

THE HIGH RISK ADOLESCENT TRAUMA PREVENTION PROGRAM

The High Risk Adolescent Trauma Prevention Program is situated in a hospital setting: the Shock Trauma Center of the Maryland Institute for Emergency Medical Services Systems, which is itself a free-standing facility associated with the University of Maryland Medical System. Planning for the Adolescent Trauma Prevention Program began in 1979 by a group of staff nurses at the Shock Trauma Center in response to their experiences with teenage patients. They believed that teenagers who are known to be drinking alcohol would become more cautious about drunk driving if they could see what happens to persons of their own age who are injured in alcohol related accidents. Funding was found initially for this program from the Maryland Department of Transportation, but now comes primarily from the Baltimore County Office of Substance Abuse through a Department of Health and Human Service grant.

By virtue of its funding, the Adolescent Trauma Prevention Program serves county residents surrounding Baltimore City. Teenage clients who participate in the program are considered at high risk of alcohol abuse as a result of having been arrested on alcohol or drug related charges. Since its inception, over 400 teenagers have participated in the program.

PROGRAM OPERATING PROCEDURE

Teenagers are brought to the Shock Trauma Center in groups of from six to eight. They meet in a room where an overview of the program is given and where they are given an opportunity to get acquainted with each other.

The group is then shown two films, both made locally. The first is of an interview with a young male who had an automobile accident as a result of drinking and whose best friend was killed as a consequence. The second documents the experiences of victims at the crash scenes of alcohol related accidents and follows them to the operating room and into follow-up care. After these films, a group discussion is held in which the teenagers are asked how they felt about what they saw and typically will voluntarily talk about physical, psychological or socio-economic outcomes resulting from their own alcohol related accidents, if any, or from those of other people they know.

Next the teenagers are taken on a tour of the Shock Trauma unit where particular attention is given to seeing young patients recuperating from alcohol related accidents. This is followed by a discussion with a current patient who describes his or her experiences.

Finally, the group has a concluding group discussion to share how they feel about what they just experienced and to discuss alternative strategies to driving after they have been drinking or to riding with someone who has been drinking. Emphasis is placed on the teenagers developing these alternatives themselves and in discussing them among themselves.

EVALUATING METHODS

Sample

The sample consists of 351 adolescents who participated in the Adolescent Trauma Prevention Program from December 1986, when data collection began, to July 1989. The sample was restricted to adolescents whose ages are eighteen and under and who had been arrested for alcohol or drug related offenses. The majority of the clients were male (75.5%). The age distribution was as follows: fourteen (4.3%), fifteen (10.5%), sixteen (21.9%), seventeen (41.9%), and eighteen (21.4%).

Procedure

A longitudinal pretest-posttest design was selected to examine changes in client attitudes about drinking and driving over a one-year period of time. Both the pretest and the initial posttest were conducted while participants were onsite during the program, with approximately two to three hours separation. Subsequent mailout posttest instruments were administered at three, six and twelve months.

The longitudinal pretest-posttest design was selected because of difficulties in trying to design a comparable control group, given that participants are often ordered by the courts to attend the program. Without a control group, alternative influences on participants' attitudes must be considered carefully. However, several factors related to the data collection design aid in assessing whether the initial posttest scores are random findings or are part of an interpretable trend related to the intervention. These include: 1) the use of multiple posttest attitude measures; 2) the fact that the total sample consists of persons who were exposed to the program at different times over the two and one half year period of data collection, thereby reducing the influence of any unique historical events; and 3) the use of multiple waves of data to explore trends.

The data collection protocol was as follows. Upon arrival at the program site, clients filled out a pretest instrument indicating their willingness to drink and

drive, to ride with a driver who is drinking, and to prevent a friend from drinking and driving.

Immediately after participating in the program and while still at the program site clients again were asked these same questions. In addition, they were asked a number of questions concerning their reaction to the program and their suggestions for improving it, along with selected demographic and self-perception questions.

Three-month, six-month and twelve-month follow-up surveys were mailed out to check on continuing willingness to drink and drive, to ride with a driver who is drinking and driving, and to prevent a friend from drinking and driving. Because response rates were 44.4 percent, 35.0 percent, and 27.4 percent respectively for these follow-up surveys, results from these follow-up surveys will need to be interpreted cautiously. More will be said on this point later.

Measures

The central attitudinal measures that were assessed concerned willingness to drink and drive, to ride with someone who has been drinking, and to prevent a friend from drinking and driving. The scale formats for these measures are shown in Tables 2 through 5 and were designed to stay close to the vernacular of the adolescents, rather than to describe drinking in technical terms such as ounces of alcohol consumed or in blood level measures. Willingness to drink and drive was measured in two ways. First, a scale was constructed to represent whether clients would be willing to drive immediately after drinking different amounts of beer. The second measure assessed whether clients would seek an alternative to driving themselves after drinking.

Willingness to ride with someone who had been drinking was also keyed to different amounts of beer consumed by the driver and used the same scale as for willingness to drink and drive. The final measure asked whether the person would try to prevent a friend from driving after drinking.

RESULTS

Tests for Possible Response Biases Arising From Mortality in Follow-up Surveys

Since response rates to the three month, six month and twelve month follow-up surveys were 44.4%, 35.0% and 27.4% respectively, the possibility of response biases must be considered. Possible response biases related to the four attitude measures are most of concern, since it is against the initial four pretest attitudes and the four corresponding on-site posttest attitudes that follow-up attitudes will be compared. Using the data that were obtained from all clients while they were on-site at the program, responding and nonresponding participants were compared

for each successive survey on their four initial pretest attitude measures and their on-site posttest attitude measures. Results from Mann-Whitney U tests for shifts in the distributions of each of these attitudes are presented in Table 1.

Table 1 shows that the groups of responding and nonresponding participants at three months and at six months did not differ on any of the four pretest or any of the four corresponding onsite posttest attitudes. A significant difference is found at twelve months, however, on the pretest attitude concerning riding with someone who had been drinking. No other differences are found on any of the other pretest attitudes or on any of the on-site posttest attitudes at twelve months.

These results suggest the presence of a response bias only at twelve months. The direction of the bias is such that respondents at twelve months were disproportionately likely to hold a greater initial willingness to ride with someone who had been drinking than was true of nonrespondents. Hence, estimates of attitudes at twelve months could suggest more willingness to ride with someone who had been drinking than are true for the full sample of clients. These twelve-month estimates will therefore need to be interpreted with caution.

Table 1. Tests for Response Biases at 3, 6, and 12 Months Based on Comparisons of Initial Pretest and On-Site Posttest Attitudes[a]

Test Variable	3 Months	6 Months	12 Months
Pretest Attitudes			
drive after drinking	–.15	–.06	.32
seek alternatives to driving	–.72	–.78	–.98
prevent friend from driving	.43	–.04	.11
ride with drinker	.55	.68	1.97*
Posttest Attitudes			
drive after drinking	–.83	.06	.80
seek alternatives to driving	–.68	.07	–1.18
prevent friend from driving	.07	.42	1.05
ride with drinker	–.04	–.33	1.33
Sample sizes			
respondents	156	123	96
non-respondents	195	228	255

[a]Values given are z-values for Mann-Whitney U tests. Positive scores indicate that responders tended to give higher scores than nonresponders.

*Significant at .05 level, two tail.

Impact of Program

Tables 2 through 5 present the distributions for the four attitude measures from pretest to twelve months. Tests of the effects of the program are made with Wilcoxon Signed Ranks tests, which are used to compare the pretest distributions to the on-site posttest, three-month, six-month and twelve-month distributions. In addition, on-site posttest distributions are compared to three-month, six-month and twelve-month distributions to search for possible longitudinal declines in the effects of the program. A presentation of all possible pairs of distributions that were actually used in the Wilcoxon tests would be unwieldy in the context of this report. Consequently, distributions based on full data available at each time point are presented in the tables for illustrative purposes. The general trends are equally evident in the full data and in the pattern of Wilcoxon test results, so this simplification of the presentation of results does not result in substantive distortions.

In Table 2, Wilcoxon signed ranks tests indicate a significant reduction in willingness to drink and drive from the pretest level for all subsequent measure-

Table 2. Pretest to Twelve-Month Changes in Willingness to Drink and Drive

	Pre-test (n = 351)	Post-test (n = 351)	3 Months (n = 156)	6 Months (n = 123)	12 Months (n = 96)
I would drive immediately after drinking:					
not after any beer	21.4	43.0	33.5	39.8	34.7
don't know after 1-2	12.0	18.5	20.0	13.8	15.8
yes after 1-2 beers	20.5	17.1	20.0	17.9	18.9
don't know after 3-4	18.2	9.4	15.5	17.9	15.8
yes after 3-4 beers	6.0	2.3	4.5	4.1	2.1
don't know after 5+	15.1	7.4	5.8	5.7	10.5
yes after 5 or more	4.3	.6	.6	.8	2.1
no answer	2.6	1.7	.0	.0	.0
	100.0%	100.0%	100.0%	100.0%	100.0%
Wilcoxon signed-ranks tests for distributional comparisons:					
1. comparison to pretest	—	–10.6**	–4.8**	–4.6**	–2.9**
2. comparison to posttest	—	—	2.4*	1.5	2.3*

*Significant at .05 level, two tail.
**Significant at .01 level, two tail.

ment periods. However, after an initial steep reduction from pretest to on-site posttest, the effect erodes somewhat thereafter, though not returning to pretest levels even by one year.

The pattern of results in Table 3 for seeking an alternative to drinking and driving versus driving oneself shows a reduction which is sustained through all time periods and does not increase significantly after the on-site posttest. These results suggest that as long as alternatives are perceived to be available, participants are more likely to use them for up to one year after participation in the program. If alternatives are not perceived to be available, the previous results in Table 2 suggest that participants will drive themselves with increased likelihood over the one year post period, though again they do not return to the level of likelihood indicated by their pretest scores.

The results for client willingness to prevent a friend from driving after drinking are presented in Table 4. Here a marked attitude shift from pretest levels is

Table 3. Pretest to Twelve-Month Changes in Willingness to Seek Alternatives to Driving After Drinking

	Pre-test (n = 351)	Post-test (n = 351)	3 Months (n = 156)	6 Months (n = 123)	12 Months (n = 96)
I would seek the following alternatives after drinking:					
definitely get someone else to drive	20.2	42.4	40.4	42.3	39.6
probably get someone else to drive	21.9	21.1	21.2	22.0	28.1
not sure what I would do	41.9	31.0	34.0	30.1	27.1
probably drive myself	13.7	4.6	3.8	4.9	4.2
definitely drive myself	2.3	.6	.6	.8	1.0
no answer	.0	.3	.0	.0	.0
	100.0%	100.0%	100.0%	100.0%	100.0%
Wilcoxon signed-ranks tests for distributional comparisons:					
1. comparison to pretest	—	–8.8**	–4.9**	–4.4**	–3.6**
2. comparison to posttest	—	—	1.0	.1	1.0

*Significant at .05 level, two tail.
**Significant at .01 level, two tail.

Table 4. Pretest to Twelve-Month Changes in Willingness to Prevent a Friend from Driving After Drinking

	Pre-test (n = 351)	Post-test (n = 351)	3 Months (n = 156)	6 Months (n = 123)	12 Months (n = 96)
I would try to prevent a friend from driving after drinking:					
yes definitely	61.5	81.2	81.4	82.9	76.6
yes probably	26.2	15.7	15.4	13.8	14.9
don't know	9.1	2.3	2.6	3.3	6.4
no	2.6	.9	.6	.0	2.1
no answer	.6	.0	.0	.0	.0
	100.0%	100.0%	100.0%	100.0%	100.0%
Wilcoxon signed-ranks tests for distributional comparisons:					
1. comparison to pretest	—	−7.0**	−4.5**	−3.9**	−1.8
2. comparison to posttest	—	—	0.3	0.3	1.2

*Significant at .05 level, two tail.
**Significant at .01 level, two tail.

maintained up through six months, but no significant difference from pretest levels is found at twelve months.

The pattern of results in Table 5 for riding with someone who has been drinking parallels those for driving after drinking: i.e., significant differences are found between the pretest and all subsequent measurement periods, but the three-month, six-month and twelve-month results shift significantly from initial posttest results in the direction of the initial pretest results. Again, the effects of the program decay over time, but not to pre-program levels. Because of a possible response bias at twelve months for this variable, the twelve-month estimate may be too high and hence suggest a closer return to pretest levels than is true for the full population. However, the twelve-month estimate is consistent with the trend discernible in the three- and six-month estimates and with the trends for the other attitudes. Furthermore, it remains significantly lower than the pretest estimate. Therefore the single response bias identified in these analyses does not appear to result in a substantive distortion in the findings.

To summarize, the effects of the Trauma Prevention Program endure over a year for seeking alternatives to driving after drinking and endure for up to six months for preventing a friend from driving after drinking. However, they decay

Table 5. Pretest to Twelve-Month Changes in Willingness to Ride With Someone Who Had Just Been Drinking

	Pre-test (n = 351)	Post-test (n = 351)	3 Months (n = 156)	6 Months (n = 123)	12 Months (n = 96)
I would ride with someone who had just been drinking:					
not after any beer	14.8	45.9	26.6	31.1	26.0
don't know after 1-2	15.7	15.4	22.1	21.3	13.5
yes after 1-2 beers	21.4	14.0	18.2	12.3	13.5
don't know after 3-4	14.2	11.1	21.4	17.2	26.0
yes after 3-4 beers	8.0	2.0	2.6	4.9	6.3
don't know after 5+	18.2	9.4	7.8	10.7	12.5
yes after 5 or more	6.0	.9	1.3	2.5	2.1
no answer	1.7	1.4	.0	.0	.0
	100.0%	100.0%	100.0%	100.0%	100.0%
Wilcoxon signed-ranks tests for distributional comparisons:					
1. comparison to pretest	—	–11.0**	–5.2**	–4.0**	–3.3**
2. comparison to posttest	—	—	2.8**	3.0**	3.4**

*Significant at .05 level, two tail.
**Significant at .01 level, two tail.

over time for willingness to drink and drive for willingness to ride with someone who has been drinking, though not to initial pre-program levels.

DISCUSSION

The focus of the Adolescent Trauma Prevention Program is on changing attitudes more so than on increasing knowledge. The typical participant in the program has already received technical information in county programs that is intended to increase their knowledge about the effects that various amounts of alcohol consumption has on judgement and reaction time or about the legal definitions of intoxication, status offenses or driving under the influence, etc. By contrast, participants in the Trauma Prevention Program are confronted with dramatic, real-life examples of injuries to persons resulting from drunk driving and of attendant long-term social and emotional consequences. As a program intended to change participant attitudes, the results show it to be highly successful.

Furthermore, the effects are evident for three of the four attitudes for up to one year.

In contrast to most alcohol and drug awareness programs, which are school-based and oriented to the general juvenile population, the participants in the Trauma Prevention Program are considered to be "high risk" because they have been arrested for alcohol and drug related incidents. It is within this type of group that attitude changes, more so than increased knowledge is most needed.

In considering alternative explanations for the patterns of long-term effects, history does not appear to be a plausible contaminant, since, as noted earlier, participation in the program occurs at different times for persons in the sample over the two and one-half years of data collection. Furthermore, no particular event occurred in the Baltimore area during the time period studied that might likely influence the results.

However, maturation, or if not maturation, some other factors, must account for the decay of the initial program effects over time for three of the four attitudes. Attempts to search for a maturation effect related to age by controlling for age in the analyses did not meet with success and are not presented in the interest of journal space. If a maturation effect associated with getting older is not the source of the decay in program effects, then we would still wish to know what is.

Other treatment factors that might account for the apparent decay in program effects are treatment demand factors and participant reactance effects, which is to say that participants may feel pressured to give desirable responses on their onsite posttest instrument and may cooperate in doing so. These effects should be greatest for the onsite posttest and diminish considerably in influence thereafter for three-, six-, and twelve-month follow-up surveys. The fact that effects are still clearly visible in the follow-up surveys suggests that the program effects could not entirely be the result of demand and reactance effects; however it is unknown how much, if any of the subsequent apparent decay in program effects may be due to the wearing off of demand and reactance effects.

Of greatest interest for further research on this type of program is the fact that some participants do not respond as desired to the program and that others, having shown a positive initial response eventually return to less desired attitudes. Furthermore the program failed to sustain an effect at twelve months on willingness to prevent a friend from driving after drinking. Additional analyses are needed to identify predictors of who will fail to respond as desired to the program and who will become a "backslider" after three, six, or twelve months. Such research would help to expand the impact of this type of program for high risk youth.

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