Evaluation of a Dutch educational 'Driving while intoxicated (DWI)' prevention program for driving schools

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1. Introduction

In the Netherlands, nearly 100% of the people who wish to obtain a driver's license is attending at a driving school. A percentage of 75% is not only following a practical driver instruction but also a theoretical curriculum [1]. Therefore offering an educational program to driving schools in order to prevent driving under the influence is a logical measure. About 85% of the pupils of driving schools are between 17 and 25, the age group with the greatest risk of alcohol-related traffic accidents [2]. As is the case in other countries, many intoxicated drivers are under 25, especially in late night weekend hours [3]. Thus, pupils of driving schools are an important, but mostly neglected, target group for primary prevention of DWI behavior. A prevention program for DWI is a unique approach since most DWI programs are offered at a later point in time to first time offenders [8] and multiple offenders [4-7]. Given the serious lethal consequences characteristic of DWI, we advocate intervention before the offense occurs rather than after.

Additional arguments for developing a preventive strategy directed at driving schools are that a DWI prevention program can be integrated into an existing curriculum in such a way that driving schools can guarantee continuity, and that a substantial number of driving schools is willing to implement the DWI theme in their curriculum [9]. In current driving schools curriculums information on alcohol-impaired driving is either absent or very minimal. Traditionally, the curriculum deals with topics concerning the highway code and is directed primarily at passing the driving test. Recently, an interest has emerged toward paying more
attention to social aspects of driving. Beyond learning how to drive, an emphasis on driving safely is now valued more highly. A DWI prevention program fits with this new focus.

2. Program description

The DWI prevention program we present in this article, is based on conditions of effective public information and education [10-13]. Kok's model of behavior change through information [14] was used for program development which is based on the concepts of Fishbein and Ajzen [15], McGuire [16] and Rogers [17]. Kok's model centralizes the individual and integrates the following conditions of effective public information mentioned in the literature: credibility of action and teacher, making information attractive, bringing awareness to existing risks, presenting clear and understandable standards, demonstrating short term advantages must be shown, adapting program content to the needs of the target group. Our DWI program aims at enhancing knowledge, improving or maintaining positive attitudes, and preventing DWI behavior.

The program, simply named "Driving While Intoxicated", is given in five or six lessons, one DWI module of 15-20 minutes length in each lesson. The curriculum topics include: (1) the use and prescription and non-prescription drugs while driving such as alcohol, medicine, cannabis, (2) legal aspects of DWI, and (3) behavior (self-control methods). The total package consists of a 20 page richly illustrated textbook, 35 slides, a videotape of 22 minutes and a manual for the instructor. The instructor's manual contains: (1) a verbatim script for each module, (2) text corresponding with the slides, (3) background information on DWI such as figures and detailed law description, (4) tips for enriching the lessons such as inviting guest speakers, demonstrating a breathalyzer, and (5) topics to discuss, for e.g. "it is my own responsibility to drink and drive" or "any alcohol before driving should be forbidden". An active learning approach rather than a passive learning approach is achieved by the use of a variety of media and a priority on group participation in discussions. In addition to an active learning approach we take a "person-directed approach", adapting the program to the specific needs, problems and social standards of the target group, which in our case are adolescents and young adults. It is our opinion that this approach is more effective than one of presenting values and moral judgment. Thus we strictly exclude a moralistic approach from our program.
3. Method

Subjects
Based on geographical criteria 100 schools were selected to participate in our study, resulting in 46 schools that implemented the experimental curriculum and 54 schools who did not. In the spring of 1987 a group of 874 students from these 100 schools filled in the research questionnaires both before and after their curriculum. Out of this group 568 subjects were willing to participate in a follow-up evaluation of which 436 actually participated. This group resulted in 208 persons in the experimental condition and 228 in the control condition. No significant differences in age, sex, level of education, marital status, drinking behavior were found between those who were willing to participate (65%) and those who were not willing to participate (35%) in a follow-up evaluation. The same was found for those who actually participated in the follow-up (77%) and those who did not (23%).

Given our relatively low refusal rate, we conclude the subjects are representative of the population of pupils of driving schools. In both groups 90% of the pupils were between 17-25 years of age (mean age 20): 40% males and 60% females. At the pretest a 85% reported drinking alcohol in general. No significant differences occurred for age, sex, marital status and drinking behavior.

Design
A pretest, posttest and one-year follow-up evaluation design was employed to examine the effects of the program on knowledge, attitudes, intention and behavior. For the experimental group the DWI program was implemented within the traditional curriculum (weekly sessions of approximately 90 minutes). The DWI-program was given in modules of approximately 15 minutes each over six weeks. The modules were added to the other material presented in the traditional curriculum. The time spent on the entire program was two hours at the most. For both experimental and control group the curriculum lasted six weeks.

Instruments
Subjects completed a questionnaire consisting of 11 knowledge items (true-false), 6 attitude items (five-point scale), 6 behavior-intention items (4 yes/no, 2 open-ended) and 5 items referring directly to DWI behavior.

Procedure
The questionnaire was filled in by the subjects in the classrooms of their driving schools just before the program started (pretest) and directly after the program concluded (posttest). One year later (follow-up) information was obtained by means of a mailed postal questionnaire to the pupils' homes.
4. Results

Knowledge

Analysis of variance yielded a significant interaction effect \((F=44.38, p<.001)\) for knowledge. The knowledge of the effects of DWI of the experimental group increased more than the knowledge of the control group (figure 1). In fact, the knowledge of the control group remained at the same initial level (mean= 5). The mean knowledge of the experimental group increased from 5.1 at t1 to 7.1 at t2 and decreased to 6.0 at t3; differences between t1 and t2 and t1 and t3 were significant \((p<.001, t\text{-test})\).

Figure 1: Mean knowledge scores

It is interesting to note that the knowledge on some topics increased more than on others. In the long run (t1-t3) the experimental group, as opposed to the control group, made the most progress on the items "Drinking coffee lessens the sedative effect of tranquilizers" (false), "Drivers under the influence of marihuana or hashish tend to underestimate their driving performance" (true), "A permillage of more than 2.5 can lead to two weeks imprisonment and one year suspension of driver's license" (true). These items refer to the topics on medicine, cannabis and legal aspects.
Attitude
Analysis of variance revealed no interaction effect for scale 1 (F=.81, p>.05); both groups increasingly accept the consequences of DWI. However, there is an interaction effect for scale 2 (F=3.92, p<.05); the experimental group developed towards a more positive attitude, whereas the control group moved towards a more negative attitude, as can be seen in the mean scores in table 1.

Table 1  Mean Attitude Score for Experimental Group (n=208) and Control Group (n=228) at Pretest (t1), Posttest (t2) and Follow-Up (t3). 1= Positive Attitude, 5= Negative Attitude.

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t1</td>
<td>t2</td>
</tr>
<tr>
<td>Scale 1: acceptance of consequences of DWI</td>
<td>2.2</td>
<td>2.1</td>
</tr>
<tr>
<td>Scale 2: awareness danger as consequence of DWI</td>
<td>1.8</td>
<td>1.7</td>
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</tbody>
</table>

It seems that the program prevents attitude deterioration on the awareness of danger scale. It should be observed that changes are mainly in the area of a positive attitude. Both groups already seemed to have positive attitudes: if the two extremes "agree" and "strongly agree" are taken together it can be said that two thirds of the pupils accept the consequences and that 90% of them are aware of the dangerous effects of DWI.

Behavior intention
As was the case with attitude, both groups also expressed a positive behavior intention on all items at all three measurements: about 85 to 90%. See table 2.
Table 2 Percentage of Pupils of Driving Schools on Behavior Intention on Pretest (t1), Posttest (t2) and Follow-Up (t3).

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group (n=208)</th>
<th>Control Group (n=228)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t1</td>
<td>t2</td>
</tr>
<tr>
<td>#1. Driving after drinking if people are telling you not to drive.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>driving</td>
<td>7.1</td>
<td>3.0</td>
</tr>
<tr>
<td>not driving</td>
<td>92.9</td>
<td>97.0</td>
</tr>
<tr>
<td>#2. Drinking more than 3 beverages at a wedding.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>12.6</td>
<td>10.1</td>
</tr>
<tr>
<td>no</td>
<td>87.4</td>
<td>89.9</td>
</tr>
<tr>
<td>#3. Driving the morning after taking a sleeping pill.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>23.2</td>
<td>15.5</td>
</tr>
<tr>
<td>no</td>
<td>76.8</td>
<td>84.5</td>
</tr>
<tr>
<td>#4. Warning a friend who is drinking too much before driving.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>81.9</td>
<td>83.1</td>
</tr>
<tr>
<td>no</td>
<td>18.1</td>
<td>16.9</td>
</tr>
</tbody>
</table>

However, on item 1 an effect was found which is worth mentioning. At t1 a small group of 7% stated that they will drive after drinking when other people tell them not to drive, but both directly after the program concluded (3%) and one year later (2%) fewer people of the experimental group declared they will drive (both p<.05, McNemar test). The control group did not change at all. A year later there is a positive change for both groups on items 2 and 3:
fewer people drink more than three alcoholic drinks at a wedding party (both p<.001, McNemar test) and fewer people drive after taking a sleeping drug (experimental group chi-square=9.30, p<.01; control group chi-square=5.95, p<.05, McNemar test).

Two other intention items inquired after their maximum number of drinks. One (item 6) was formulated as follows: "Suppose you are hitting the town with some heavily drinking friends. Let's say from 10 p.m. till 2 a.m. What is your maximum number of alcoholic drinks, spread over those four hours, if you are supposed to drive home afterwards?" At t1 the experimental group reported a maximum of 1.7 drinks (see table 3B); this figure decreased to 1.2 drinks at t3 (sd=1.6, t=3.93, p<.001, t-test); the control group reported 2.1 drinks at t1 and 1.6 drinks at t3 (sd=3.1, t=2.31, p<.05, t-test). So both groups reduced their drinking intention one year after the curriculum.

The other intention item (item 5) was meant only for pupils who obtained their driver's license: "What is your maximum number of alcoholic drinks if you have to drive within the next two hours?" 100 Subjects of the experimental group who got their driver's license reported drinking no more than 1.3 glasses of alcoholic drinks at t1, which decreased to 0.9 glasses at t3 (sd=1.5, t=2.61, p<.05, t-test). 96 Subjects of the control group in possession of a driver's license reported 1.3 drinks at t1 and 1.1 drinks at t3 (no significant difference).

Self-reported behavior
There is no evidence that the DWI program had any effect upon reported driving while under the influence, as can be seen in table 3.

Table 3. Cumulative Percentage of Pupils of Driving Schools in Possession of a Driver's License Reporting DWI in the Past Year. Absolute Numbers Between Brackets.

<table>
<thead>
<tr>
<th>Under the influence of:</th>
<th>Experimental Group (n=117)</th>
<th>Control Group (n=112)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ six beverages</td>
<td>1.7 (2)</td>
<td>3.6 (4)</td>
</tr>
<tr>
<td>≥ four beverages</td>
<td>7.7 (7)</td>
<td>9.0 (6)</td>
</tr>
<tr>
<td>≥ two beverages</td>
<td>23.1 (27)</td>
<td>20.5 (23)</td>
</tr>
<tr>
<td>medicinal drug</td>
<td>2.7 (3)</td>
<td>0.9 (1)</td>
</tr>
<tr>
<td>marihuana or hashish</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>
It should be highlighted that more than 20% of all respondents reported driving while under the influence of at least two alcoholic drinks within the first year after obtaining their driver’s license.

The questionnaire also included an item asking whether they had ridden with an intoxicated driver in the past year. The same question was asked for the past four weeks. It may be concluded that after following the DWI program the experimental group diminished riding with an intoxicated driver. Table 4 shows that at t1 74% reported riding with an intoxicated driver, which had decreased to 58% one year later (chi-square=7.31, p<.01, McNemar test).

**Table 4** Percentage of Pupils of Driving Schools in Possession of a Driver’s License Reporting Riding with an Intoxicated Driver.

<table>
<thead>
<tr>
<th></th>
<th>Experimental Group (n=117)</th>
<th>Control Group (n=112)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t1  t2  t3</td>
<td>t1  t2  t3</td>
</tr>
<tr>
<td>past year</td>
<td>73.5 65.0 58.1</td>
<td>57.1 57.1 54.5</td>
</tr>
<tr>
<td>past four weeks</td>
<td>41.0 30.8 28.2</td>
<td>25.9 17.9 24.1</td>
</tr>
</tbody>
</table>

The same results were found in regard to the past four weeks: a drop from 41% to 28% (chi-square=3.84, p<.05, McNemar test). Within the control group no significant differences can be found. It should be mentioned, however, that prior to the curriculum the control group reported significantly less riding with an intoxicated driver than the experimental group.

### 5. Discussion

We conclude from our findings that participation in a DWI program does lead to improved knowledge about DWI. The fact that greatest improvements are accomplished on items referring to the topics of driving under the influence of medicines, driving under the influence
of cannabis, and legal aspects, implicate that it is worthwhile to pay attention to these topics. This makes the program also interesting for those who are reluctant to be taught facts about alcohol.

Also, knowing the answers of seven out of eleven items is not a maximum effect.

Attitudes and behavior intentions appeared positive during the pretest and remained so. The results implicate that one should try to strengthen attitudes and intentions rather than to change them. More important, the program seems to prevent attitude deterioration (awareness of danger) and results indicate that the group of pupils licensed to drive plan to drink less alcohol before driving compared to a control group. In addition, it seems that attitudes and intentions are not adequate predictors of actual behavior: those who reported DWI in the past year also reported a positive attitude and behavior intention towards DWI.

No effect on actual DWI behavior was found: in both experimental and control group more than 20% reported DWI behavior in the past year. This means that one out of five persons drive under the influence of alcohol in the first year of having a license. We conclude it is not easy to influence DWI behavior, though the experimental group reported using methods to control drinking behavior more than the control group (76% versus 62%). These methods, i.e. having a non-alcoholic drink in mind, saying no, drinking small sips, putting your glass down instead of holding it in your hand, were mentioned in the textbook.

A remarkable effect of the program is the positive impact on the behavior of riding with an intoxicated driver. It is recommended that this should be an explicit goal of DWI prevention programs. The target group should be approached not only as potential intoxicated drivers but also as the social environment of intoxicated drivers. This will stimulate social control.

Why didn't we find larger effects on attitude, behavior intention and behavior? Some reasons.

1. Seen from a didactical point of view the program is probably not put to optimal use. One of the most important elements of the program was to elicit discussions in order to make the pupils think about DWI topics themselves. But not all teachers of driving schools can be expected to have the necessary skills directly available in their repertoire.

One difficulty with program implementation, was that teachers did not always know how to handle pre-existing resistance of pupils to a DWI program. Therefore the latest edition of the manual includes information about how to deal with resistance. It takes effort, time and talent to acquire the necessary teaching skills. A greater effect may be achieved in the future when teachers are more experienced. This also states the importance of pre-and in-service teacher training [18].

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2. Social desirability remains a problem with self-reported data on undesirable behavior. It is probable that those people who mailed back the questionnaire (77%) at the follow-up were more likely not to drive after drinking. At the other hand, people who did not mail back the questionnaire (23%) did not differ in drinking behavior (average number of beverages) as measured at the pretest. Social desirability or underreporting may mask the true effects of the DWI program.

3. Change in knowledge and attitude is necessary but not sufficient to produce desirable behavior change. Another necessary condition to fulfill is that people must learn certain social skills. It is conceivable that too little attention is paid to alternative behavior possibilities (how to resist social pressure). More accent on a social competency approach in which skills are taught to resist social influences [18] might have been more effective. In the program the textbook is the only element paying attention to behavior possibilities. In comparison with written information, role-playing is probably a far better method because of actual practice of alternative behaviors [14, 19]. The setting of driving schools limits their impact. If possible, however, DWI programs should use peers as discussion leaders (peer-led system) [20], and should attempt to have participants experience the effects of DWI directly [21], for example on closed driving circuits or driving simulators. Another important factor in the process of behavior change is self-efficacy. The teacher could try to enhance students expectations if they are low ("It's not gonna work for me"). In order to prevent relapse, age-appropriate booster sessions or mailing information afterwards from time to time are recommended [22]. This function can be accomplished by public information programs (campaigns as a reminder).

4. This program was directed at the individual and integrated assumed effective conditions on a micro level but not on a macro level. Conditions on macro level such as coordination, guaranteed continuity and political support of action are also factors of importance for a successful preventive strategy [13].

5. The impact value of the program may be enhanced by broadening the implementation, especially in secondary education. Impact may also be enhanced by including questions on alcohol, medicines and drugs in the Driver Examination. At the moment the Dutch government examines how this last suggestion can adequately be implemented.

Acknowledgements

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References


