Effectiveness of road safety educational program for pre-drivers about DUI: practical implication of the TPB in developing new preventive program in Slovenia

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Abstract

Main purpose is to address effectiveness of educational program for pre-drivers regarding driving under influence of alcohol (DUI) or riding with intoxicated driver. Young drivers and participants are at over-average risk in traffic (European Commission, 2012), and DUI is one of major contributing factors (Elliot, 2004). We have designed and developed new road-safety educational program focusing on pre-drivers in high-schools and dealing with DUI taking into account various recommendations and concepts with the integration of different approaches. In the research we have used the Theory of planned behavior (TPB, Ajzen, 1985, 1991; Forward, 2010; Moan, 2013) as a basis of influencing the components of the model. Program has been evaluated with quasi-experimental research, measurements before-after and 1-month follow-up. There were 269 participants included (16 – 18 years old), which attended the integrated intervention program or control group. We have measured TPB components, as well as evaluation of the program. We’ve also measured phase of behavior change in accordance with Trans-theoretical model of change (TTM, Prochaska and DiClemente, 1983; 1999). Results show no significant effect of the intervention program on general attitudes and TPB components through time. There was an improvement regarding the process of change. Also the intervention group better evaluated the program and assessed the effects and satisfaction showing that there are some promising results. In discussion we address possible reasons for such results, as short duration of the program, very high results before the program etc. Practical implications of research are development and adaptation Slovene relevant instruments for measurement of TPB components for adolescents and DUI and to establish effective components of educational program to perform a road safety education with youngsters in high school level.

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1. Introduction

1.1. Road safety of young people

Young drivers are over-represented in motor vehicle crashes in general as a global problem. Compared to older drivers, the accident risk of young drivers (18-24 years) is up to twice as high (European Commission, 2010, 2012). Road crashes are the main cause of mortality of young people (World Health Organization, 2007). In the EU countries 17% of the traffic victims are young people (mostly as drivers and passengers), while they represent only less than 9% of populations (Glendon, McNally, Jarvis, Chalmers, Salisbury, 2014). Many studies have shown that the road safety education should be focused not only at novice drivers, but also before they actually get a license.

In Slovenia there is similar situation regarding the traffic safety of young people and especially young drivers. According to the statistics for the last five years young drivers are most often involved in accidents as drivers of passenger cars (43% of deaths of young people and 33% of serious injured) and passengers in cars (28% of deaths and seriously injured). Comparing the data of young as causers of the accidents and comparing it to the number of driving-license holders of different age groups we can find out, young drivers 18-24 of age cause a fatal accident twice as high as the average Slovene driver. The main causes of road accidents with young drivers in Slovenia are associated with speeding (26% of accidents involving young people aged 18-24 years), dangerous overtaking and tailgating (19% of incidents) and wrong direction driving (17% of incidents). Among young drivers there is also often to drive under influence of alcohol, in year 2014 there were 5 killed young drivers and 138 severely injured in car accidents regarding drink-driving. In last five years perspective (2010-2014) there is almost 15% of drivers DUI as causers of fatal accidents in age group 18-24 years. Regarding the alcohol concentrations of young drivers (which have 0,0 tolerance till 21 years) data show that 33% of them had less than 0,05, and 41% over 1,1 g/kg blood alcohol level.

1.2. Theoretical background

Different authors have found out that some general personal variables are important for the safe behavior in traffic. One of the most cited and used theories is the Theory of planned behavior (TPB, Ajzen, 1985, 1991; Forward, 2010), which can provide useful basis for the research model of influencing the participants attitudes and behavior intention to obtain behavior change. Authors (Brijs K., Cuenen, Brijs T., Ruiter, Wets, 2014; Forward, 2010; Delhomme, De Dobbeleer, Forward, Simoes, 2009) have established empirically supported validation of the TPB and its effectiveness (Ajzen, 1985; Elliott, 2004; Forward, Kazemi, 2009; Forward, 2010) in connection with development of interventions and influencing components of model (behavioral intention, moderated by attitudes, subjective norm and perceived behavioral control, as good predictor of behavior).

A review of 185 studies demonstrated that the TPB model accounts for 39% of variance in intentions and 27% of variance in behavior (Armitage and Conner, 2001). Some authors suggest some other variable to be added to the model to improve its predictive value, such as past behavior (Sheeran, Orbell, 1999; Brijs et al., 2014).

1.3. Road safety educational programs and evaluations

Good basis for designing road safety education (RSE) program is a matrix Goals for drivers education (GDE, Hatakka, Keskinen, Baughan, Goldenbeld, Gregersen, Groot, Siegrist, Wilmess-Lenz, Winkelbauer, 2003), which provides four levels: lower learning objectives (manoeuvring and control of traffic situations); higher levels (context and objectives of driving and life objectives), which should be included in educational programs with approach of internal insight (Fylan and Stradling, 2014). This approach tries to raise awareness and improve insight into risk
Young people display many of the attitudes associated with risky driving well before they reach the age they can earn to drive (Waylen, McKenna, 2008). There is not lot of the research compiling indirect effects of education on antecedents to behaviour change in pre-drivers, such as attitudinal change. Mann and Sullman (2008) and Glendon and other authors (2014) were in their researches dealing specifically with evaluation of pre-driver training program and focusing on psychological antecedents of behaviour. A review (Hardeman et al., 2002, in Poulter and McKenna, 2010) investigated the effects of classroom-based interventions and found little evidence to support the efficacy of pre-driver training. Also there is evidence that persuasive fear messages can have a reliable effect on attitudes, intentions and behaviour, even the effects are relatively weak (Witte, Allen, 2000).

Previous research has not shown convincing evidence of long-term effects of education on behaviour, but if there is positive effect on attitudes from dramatic presentations can persist for at least 8-10 weeks after the intervention (O’Brien, Rooney, Carey, Fuller, 2002; in Poulter, McKenna, 2010). As authors of the evaluation (Williams, Ferguson, 2004) of post-license road safety program recommend to designers of short duration program not to be overambitious in the number of objectives to be reached, half day is simply too short to address a variety of issues like speeding, drink-driving, risk detection and risk-related knowledge: “Less could be more”. Also some other limitations are pointed out in literature; even there is improved knowledge and awareness after the education program that does not necessary transfer to improve behaviour (Zeedyk, Wallace, Carcary, Jones, Larter, 2001).
1.4. Current study

The current study aimed to evaluate the integrated road safety program for pre-drivers aiming to reduce DUI, along with the program’s evaluation of effectiveness, based on application of the TPB. It has used self-report measure before and after the intervention program and 1-month follow-up with comparison to control group and involving 16-18 years youngsters in secondary schools.

It was hypothesized that there will be Time x Group interaction, supporting that participants in the program (intervention group) will report after the intervention program safer TPB components regarding DUI (attitudes, social norms, perceived behavior control and positive behavior intentions), more positive attitudes to sober driving and higher stage of change (from pre-contemplation to action phase). And also intervention group will assess program generally positive and will report about different effects of the program such as knowledge, etc.

2. Method

2.1. Participants

In broader research (dealing with evaluation of different approaches) participated all together 736 participants, age range 16-18 (M = 16.99 , SD = 0.80). For the purpose of this presentation we have used only a part of the sample involved in integrated road-safety educational program and control group (N = 269; 56.5% males, 43.5% females; 147 in intervention and 122 in control group), otherwise the research would be too complex for the purpose of this article and involving different measurements regarding the pre-driver education. Participants were high-school students from 7 different secondary schools around Slovenia and also from different secondary education programs: vocational (18.7%), high-school (22.7%) and gymnasium (58.6%). Participants were randomly assigned by anonymous codes to the intervention (integrated program approach) or control group.

2.2. Materials

In the study we have used a battery of 5 different questionnaires. For the purpose of the research we have designed and developed adapted short version of TPB questionnaire in Slovene for pre-drivers focusing specifically on DUI, consisted of 16 items measuring 5 factors: attitudes (ATT, 3 items, alpha 0,797), subjective norm (SN, 2 items, alpha 0,463), perceived behavior control (PBC, 4 items, alpha 0,645), intentions (BI, 3 items, alpha 0,72), risk-perception (2 items, alpha 0,881) and past-behavior (2 items, alpha 0,428). All items had a 5-point Likert scale (1 = strongly disagree to 5= strongly agree). Higher scores reflect more positive concerns regarding traffic safe behavior (not driving under influence).

General attitudes toward DUI were measured using the Pre-driver attitude DUI questionnaire adapted from the Driver attitudes questionnaire (DAQ, Parker et al., 1996; Helman et al., 2011), specifically focusing only on drink-driving. It includes 15 self-report items on three factors: positive attitudes toward DUI and risk under-estimation (6 items, alpha 0,673); negative attitudes to DUI (6 items, alpha 0,803) and social issues of DUI (3 items, alpha 0,655), participants had to indicate their agreement with statements on 5-point Likert scale (1 = strongly disagree to 5= strongly agree).

For the evaluation of the program we have used semantic differential about the connotative assessment of the program of 10 opposite adjectives (bad - good, negative - positive, short - extensive etc.), which participants assessed on 5-point scale, higher scores meaning more positive assessment of the program. Factor analysis gave three factors solutions, referring on general evaluation (4 items, 0,80) , usefulness (3 items, 0,78) and emotional response (3 items, 0,64).
The effects of the program have been measured as self-report assessment on the 12-items scale (Divjak, 2010), 8 of them are specific to DUI and 4 are more general referring to general traffic safety. Items involve different specific effects as assessment of knowledge, awareness, and critical consideration, warning others, future intentions, self-reported behavior change and general attitude to traffic safety. It uses 5-point Likert scale (1-strongly disagree to 5-totally agree). Confirmative factor analysis gave these solution: general effects (7 items, alpha 0.83); specific effects (4 items, alpha 0.86).

Program satisfaction scale (adapted from Beadnell, Nason, Stafford, Rosengreen, Daugherty, 2012) measures the general satisfaction with the program with 9 items on 5-point Likert scale (1-disagree, 5-agree; one-factor solution, alpha 0.93). General higher scores mean greater satisfaction with the program.

2.3. Intervention program and control group

We have developed educational program for young pre-drivers with scope on DUI in context of implementation of TPB taking into account theory-based evidence and recommendations from literature in developing effective programs (active methods, informative, emotional and socio-critical approaches, working in peer-groups, school classes, focusing only on drink-driving safety issues and coping strategies etc.). Program lasted about 90 minutes and was executed by young moderators (students) specially educated and trained. We have integrated different approaches from giving knowledge and information about drink-driving problem and traffic safety of young (informative approach), giving emotional and motivational aspects with presenting actual accidents, videos and the consequences (emotional approach), and finally exchange of the experiences and opinions among youngsters, insight critical feedback in peer group and leaded discussion toward safer behavior regarding drink-driving (coping strategies, alternatives etc.) (socio-critical approach). Control group was also gathered together at same situation as intervention group and for same time, they were doing some common activities in class but in no connection to road safety and drink-driving.

2.4. Procedure

For the study we have used quasi-experimental design with intervention (EG) and control group (CG), measuring before the intervention (T1), immediately after (T2) and with follow-up 1-month after the program (T3). The survey took around 20-30 minutes to complete on each occasion. The implementation of the study was going on from February till June 2015. The study was approved by the University of Ljubljana Human Research Ethics Committee and required ethical guidelines were addressed through all research activities. We have included 7 secondary schools and 1 for pre-testing. Participants and their parents were asked to sign a written permission and an informed consent to participate in the study.

For the analysis we have used SPSS v21.0. For all results the statistical significance are reported using p values, significance level was set at $\alpha = 0.05$.

3. Results

Beforehand exploratory and confirmatory factor analysis was made to test the validity of the measurement and also the reliability tests on all first measurements. Some of the items were excluded from further analysis because of low loadings. Factors were formed as mean value of items they were measured with.

Primary analysis was conducted using a repeated measures design multivariate analysis of variance MANOVA, with ANOVA results for each TPB factors and other questionnaires’ factors. For the significant effects Bonferroni pairwise comparisons were employed for post hoc analysis of specific individual comparisons.
Table 1. Included variables with factors, means (standard deviation) for intervention and control group for three measures in time (before, after and 1-month follow-up) are represented.

| Variable                              | Intervention program | Control group |
|---------------------------------------|----------------------|---------------|
|                                       | t1 (n = 132)         | t2 (n = 147)  |
|                                       | t3 (n = 131)         | t1 (n = 112)  |
|                                       | t2 (n = 123)         | t3 (n = 106)  |
| General attitudes DUI                 |                      |               |
| risk underestimation                  | 4,26 (0,62)          | 4,17 (0,71)   |
|                                       | 4,16 (0,76)          | 4,31 (0,54)   |
| social issues                         | 4,51 (0,63)          | 4,19 (0,78)   |
|                                       | 4,30 (0,67)          | 4,52 (0,64)   |
| negative attitudes DUI                | 4,07 (0,73)          | 3,79 (0,83)   |
|                                       | 3,86 (0,79)          | 4,09 (0,77)   |
| TPB attitudes                         |                      |               |
| attitudes                             | 4,45 (0,74)          | 4,43 (0,81)   |
|                                       | 4,35 (0,82)          | 4,46 (0,82)   |
| subjective norm                       | 4,23 (0,89)          | 4,06 (0,95)   |
|                                       | 4,03 (0,93)          | 4,22 (0,78)   |
| perceived behaviour control           | 4,48 (0,70)          | 4,26 (0,90)   |
| intentions                            | 4,27 (0,89)          | 3,99 (1,00)   |
|                                       | 4,13 (0,89)          | 4,31 (0,80)   |
| perceived risk                        | 3,75 (0,62)          | 3,80 (0,60)   |
|                                       | 3,75 (0,65)          | 3,78 (0,65)   |
| past behaviour                        | 4,74 (0,47)          | 4,52 (0,81)   |
|                                       | 4,5 (0,80)           | 4,68 (0,51)   |
| Evaluation of program                 |                      |               |
| general evaluation                    | 3,85 (0,79)          | 3,36 (0,83)   |
| usefullness                           | 4,04 (1,01)          | 3,57 (1,04)   |
| emotional response                    | 3,29 (0,87)          | 3,31 (0,88)   |
| Program Satisfaction scale            |                      |               |
| general satisfaction                  | 3,45 (0,78)          | 3,29 (0,92)   |
| EFFECTS OF PROGRAM                    |                      | 2,43 (1,08)   |
| specific effects                      | 3,73 (0,70)          | 3,6 (0,79)    |
|                                       | 3,6 (0,79)           | 3,02 (1,06)   |
| general effects                       | 3,38 (0,85)          | 3,28 (0,92)   |
|                                       | 3,28 (0,92)          | 2,63 (1,14)   |
| Readiness to change stage             |                      |               |
| pre-contemlation (PC)                 | 14 (10,6%)           | 0 (0%)        |
|                                       | 0 (0%)               | 12 (10,8)     |
| contemplation (C)                     | 15 (11,4%)           | 29 (19,9%)    |
|                                       | 10 (7,7%)            | 12 (10,8)     |
| action (A)                            | 103 (78,0%)          | 117 (80,1%)   |
|                                       | 120 (92,3%)          | 87 (78,4)     |

Results of the MANOVA for repeated measures showed no significance effect of the program and interaction time*program, but there was significant effect of time (measurements T1, T2 and T3). The results show that almost in all variables of the general attitudes (risk-underestimation, social issues and negative attitudes DUI) and TPB variables (attitudes, subjective norm, perceived behavior control, intention, risk perception and previous behavior) there were differences regarding the time of the measurement, but in unwanted direction. There was a significant effect of time of the measurement of general attitudes (λ = 0.726; F (6, 208) = 13.051, p < 0.01). Comparisons between the averages from different measurements (Table 1) show that there was decrease in the variables regarding the safety through time of the measurement, even though the differences of averages through time are very small in absolute way (effect size d = 0.15 is small). The results of MANOVA repeated measures show that the effects of the program on general attitudes were not significant (λ = 0.998; F (3, 211) = 0.157, p > 0.05) and also the interaction between program and time was not significant (λ = 0.995; F(6,208) = 0.158, p > 0.05).

Regarding the TPB components the multivariate effect of time was significant (F(12, 200) = 4.505, p < 0.01), program (F(6, 206) = 0.053, p > 0.05) and interaction time*program (F (12, 200) = 0.623, p > 0.05) were not significant. For specific TPB factors there was effect of time significant for attitudes (F(2,422) = 7.447, p < 0.01), subjective norm (F(2,422) = 3.580, p < 0.05), perceived behavior control (F(2,422) = 7.188, p < 0.01), intentions (F(2,422) = 13.706, p < 0.01), risk perception (F(2,422) = 1.15, p > 0.05) and past behavior (used Green-Geisser,
F(1.8, 383.7) = 11.166, p < 0.01). The results show that the attitudes, subjective norms and other factors were higher before the intervention than after for both groups. There were no significant differences regarding the TPB factors or general attitudes factors between program groups (intervention v. control).

For further analysis we have employed a multi-level linear regression analysis, because of some violations of the MANOVA assumptions (different group sizes regarding the program, normality of distribution and sphericity for some variables). Multilevel linear modeling with random intercept and time as repeated measure with assumed diagonal error matrix and REML estimation was used to test the relationship between time, educational program and each of the dependent variables (factors). Two-level regression model was defined (inclusion of schools as third level was tested before, no statistically significant variability lies between schools). For categorical response variables multilevel multinomial logistic regression was performed using cumulative logit link function. Only main effects of variables are shown, interaction is shown only where statistically significant. Differences in mean evaluation of each program were tested using independent t-test.

### Table 2. Effects of the program and time of measurement regarding the general attitudes toward drink-driving on three factors (results of the multi-level linear regression analysis).

|                      | Risk-underestimation | Social issues | Negative attitudes DUI |
|----------------------|----------------------|---------------|------------------------|
| **Program**          |                      |               |                        |
| intervention program | 0.01 (0.851)         | 0.00 (0.987)  | -0.01 (0.931)          |
| control group        | Ref.                 | Ref.          | Ref.                   |
| **Time**             |                      |               |                        |
| T1 before            | 0.15 (<0.001)        | 0.22 (<0.001) | 0.23 (<0.001)          |
| T2 after             | 0.01 (0.832)         | -0.1 (0.026)  | -0.04 (0.47)           |
| T3 follow-up         | Ref.                 | Ref.          | Ref.                   |

Averages of general attitudes towards drink-driving are at all time points very high and show negative attitude towards driving under the influence of alcohol (Table 1), they are significantly associated with the time of testing (the averages at first measurement show statistically significant higher scores than in other measurements). In the social issues factor of general attitudes, the mean score is significantly lower immediately after the program as at 1-month follow-up. The absolute differences in average values at different measurements are very small (Table 2).

### Table 3. Effects of the program and time regarding the components of TPB (multi-level linear regression analysis).

|                      | Attitude | Subjective norm | PBC | Intentions | Perceived risk | Past behavior |
|----------------------|----------|-----------------|-----|------------|----------------|---------------|
| **Program**          |          |                 |     |            |                |               |
| intervention program | 0.06 (0.458) | -0.02 (0.822) | 0.03 (0.689) | 0.02 (0.788) | 0.06 (0.355) | 0.03 (0.608)  |
| control group        | Ref.     | Ref.            | Ref. | Ref.       | Ref.           | Ref.          |
| **Time**             |          |                 |     |            |                |               |
| T1 before            | 0.17 (0.001) | 0.19 (0.003) | 0.22 (<0.001) | 0.22 (<0.001) | 0.05 (0.277) | 0.21 (<0.001) |
| T2 after             | 0.11 (0.029) | 0.06 (0.333) | 0.03 (0.611) | -0.06 (0.303) | 0.05 (0.286) | 0.04 (0.47)   |
| T3 follow-up         | Ref.     | Ref.            | Ref. | Ref.       | Ref.           | Ref.          |

Regarding the TPB components absolute differences in averages at different measurements are very small, the values are at all time points very high and shows negative attitude towards driving under the influence of alcohol in general (Table 1). The results show statistically significant association with the time of testing. In all cases, except the detected risk, the average score for the first measurement is statistically significant higher than after the program. With the attitudes there is statistically significant higher results immediately after the intervention program comparing to follow-up after one month (Table 3).

Time of measurement is also associated with stage of change as assumed from the TTM. Earlier measurements lower the predicted odds of being on action level versus the combined pre-contemplation and contemplation level. The odds for being on action vs. lower levels before in comparison to one month after the program are multiplied by
approximately 0.2 (or are only about fifth as likely). The odds for being on action vs. lower levels immediately after the program in comparison to one month after are multiplied by approximately 0.3 (or are only about third as likely).

Table 4. Effects of the program and time regarding the stage of change (results of the multi-level multinominal logistic regression).

|               | RO (95% conf.interval) | p value |
|---------------|-------------------------|---------|
| **Time**      |                         |         |
| T1 before     | 0,15 (0,10; 0,22)       | <0,001  |
| T2 after      | 0,31 (0,22; 0,44)       | <0,001  |
| T3 follow-up  | Ref.                    |         |
| **Program**   |                         |         |
| intervention  | 1,21 (0,84; 1,73)       | 0,307   |
| control group | Ref.                    |         |

Table 5. Effects of the program and time regarding the stage of change (multi-level multinominal logistic regression).

|               | B (p value) |
|---------------|-------------|
| **Program**   |             |
| intervention  | 0,76 (<0,001) |
| control group | Ref.        |
| **Time**      |             |
| T2 after      | -0,09 (0,306) |
| T3 follow-up  | Ref.        |
| **Interaction** |           |
| Time* program | 0,26 (0,032) |

Regarding the evaluation of the program the results of MANOVA for repeated measures show the main multivariate significant effect of program ($\lambda = 0.796$; $F (3,227) = 19.339, p < 0.01$), but not for time ($\lambda = 0.974$; $F (3,227) = 2.059, p > 0.05$) or interaction program*time ($\lambda = 0.973$; $F (3,227) = 2.089, p > 0.05$). If we take closer look on univariate effects there is time significant for the specific effects of program ($F (1,229) = 3.790$ for Green-Geisser, $p < 0.05$) and interaction program*time for satisfaction ($F (1,229) = 3.676$ for Green-Geisser, $p < 0.05$). Regarding the program there is significant effect for satisfaction ($F (1,229) = 54.816, p < 0.01$), general effects of program ($F (1,229) = 36.667, p < 0.01$) and specific effects of program ($F (1,229) = 44.235, p < 0.01$). The comparisons of means show that participants in intervention group assess program with higher satisfaction immediately after the program ($M_{\text{inter}} = 3.45$, $SD = 0.78$; $M_{\text{cont}} = 2.43$, $SD = 1.08$) and also still after one month. Similar it is with specific effects of the program ($M_{\text{inter}} = 3.73$, $SD = 0.70$; $M_{\text{cont}} = 3.02$, $SD = 1.06$) and general effects ($M_{\text{inter}} = 3.38$, $SD = 0.85$; $M_{\text{cont}} = 2.63$, $SD = 1.14$). Also there is some decrease in evaluation of the program after one month in intervention group which is expected.

There is a correlation between the type of program and assessment of satisfaction with the program over time. Average satisfaction with the program is significantly higher in the intervention group compared to control group. Over time, the score between the two groups slightly changes, it remains unchanged in the control group, but in the intervention group is slightly reduced (interaction is statistically significant).

Both general and specific effects of the program are significantly higher in the intervention group. There is a statistically significant difference in the overall evaluation of the program and the usefulness of the program for students who have been in the intervention group comparing to control group ($p <0.001$).

Table 6. Effects of the program and time regarding different effects of the program (multi-level linear regression analysis).

|               | Specific effects | General effects |
|---------------|-----------------|-----------------|
| **Program**   | B (p value)     | B (p value)     |
| intervention  | 0,70 (<0,001)   | 0,67 (<0,001)   |
| control group | Ref.            | Ref.            |
| **Time**      |                 |                 |
| T2 after      | 0,11 (0,074)    | 0,02 (0,824)    |
| T3 follow-up  | Ref.            | Ref.            |

Table 7. Evaluation of the program in different groups.

|               | Intervention | Control group | t    | df  | p value |
|---------------|--------------|---------------|------|-----|---------|
| General       | 3,85 (0,79)  | 3,36 (0,83)   | 4,92 | 266 | <0,001  |
| evaluation    |              |               |      |     |         |
| Usefullness   | 4,04 (1,01)  | 3,57 (1,04)   | 3,75 | 266 | <0,001  |
| Emotional     | 3,31         | 266,00        | 0,85 |     |         |
| response      | 3,29 (0,87)  | (0,88)        | 0,19 |     |         |

4. Discussion

The results of the study show that the impact of the intervention program showed no effect on the general attitudes of the participants and on components of the theory of planned behavior, since the results are even slightly lower immediately after the completion of the intervention program, as well as after one month follow-up. These results are somehow in confirmation to some other research, which found out little evidence to support the efficacy
of pre-driver education on the components of the TPB model (Carcary, Power and Murray, 2001 in Poulter, McKenna, 2010). Such results may be due to the fact that all participants in intervention and also in control group show already in the basic measuring extremely high on attitudes toward drink-driving, that is reporting very safe attitudes regarding DUI. Given that, all means of attitudes are higher than the rating 4 - strongly agree (the average mean is almost 4,3 on 1-5 point scale), there is very little room for more improvement. Such results may also be due to the fact that the participants were made aware with the purposes of research in advance and, consequently, also about the general aim of the program (due to the informed consent regarding the aim of the study). So the results of the first measurement could show strong answers in the direction of social desirability, in both control and intervention group. In the second measurement, the level is somehow reduced in both groups, maybe because of the greater critical thinking of participants and after one month in the intervention group slightly increases, which may indicate a trend of changing process after the intervention. In addition, it is necessary to draw the attention to the size of differences between individual measurements and results between the two groups, since the differences are in absolute aspect very small. The absolute size of the impact is therefore extremely small and we cannot actually make any practical conclusions regarding these results. No evidence of the effects of intervention program on attitudes of the participants may be also due to the relatively short duration of the program (90 minutes), as some authors (Williams, Ferguson, 2004) point out that the one-time and short-term intervention is not enough to detect any effects from the perspective of relatively stable socio-psychological components, such as attitudes, social norms, perceived behavioral control etc. Relatively short intervention program in duration could be too short to have an impact. Authors (Elkington, 2012; Glendon et al., 2014) have argued that the effectiveness of road safety programs tend to be short lived unless their key messages are reinforced after certain time. The results indicate that one-occasion delivery for short time is likely to be less effective than providing repeated influencing and using combined approaches.

Given the process aspect of behavior change results show greater difference in the intervention group, as the proportion of participants who are at a higher level (contemplation and action) increased after the intervention program and compared with the control group. We can suspect that there is some process of changing in the intervention group going on, but only after some period of time (after one-month follow-up).

The evaluation of the intervention program shows positive aspects and the overall satisfaction with the program compared with the control group and the positive assessment of the effects of the program, both general and specific (knowledge, critical attitude, etc.). So from subjective point of participants themselves we can conclude that they find the intervention program as effective and satisfactory.

It can be concluded that based on the research results we cannot conclude on the effectiveness of the program impact on pre-drivers’ general attitudes toward DUI and socio-psychological components, such as attitudes, social norm, perceived behavior control or perceived risk. It could be, that with time there was an increase of the sensitivity and critical view to their own behavior regarding DUI. Participants in the program otherwise evaluate the program as useful and with the high satisfaction, and also report on the effects of the program in terms of self-critical thinking, knowledge and awareness gathering etc. In addition, results may be due also to some other factors which had influenced the attitudes towards driving under influence. For example due to the change of season (from March to May) young people could become less critical to driving under influence of alcohol, because of more frequent alcohol consumption and greater likelihood that participants find themselves in the described situation (with May and June participants could be involved in more out-side entertainment and experiencing drinking occasions because of better and warmer weather, and consequently also could be more likely to be involved in possible drink-driving situations). It would also be interesting to look at the effects of the program in detail through the differences between school programs (vocational, high-school and gymnasiuims), as some authors have reported that young people with a lower education (eg. vocational schools) are less aware of problem DUI and also have less negative attitudes DUI.

The results should be understood within the limitations of the study, starting from relatively very short program delivered for just single occasion, regarding the possibilities involving high-schools into the research. The other limitations could be also new and not pre-validated questionnaires; therefor there is lack of different previous studies on Slovene samples dealing with psycho-social elements of road safety issues for youngsters.

This study has possible road safety practice and policy implications in future in Slovenia. The results show medium effects on pre-drivers attitudes and other psycho-social issues important for safe behavior. From the results
of the program evaluation there could be program further developed, such as prolongation of the program and repeated activities after certain time to make the program more effective. From the designing the policy could be to systematically introduced such a program in high-school education in Slovenia, as one part of the driver training for licensing, specifically focusing on risk perception and more critical thinking and judgement of past-behavior.

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