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THE DRINKING HABITS OF USERS OF AN ALCOHOL DRINKING SCREENING WEBSITE IN SLOVENIA

PIVSKE NAVADE UPORABNIKOV SPLETNE STRANI, UGOTOVLJENE Z VPRAŠALNIKOM O PITJU ALKOHOLA V SLOVENIJI

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ABSTRACT

Background. Alcohol consumption in Slovenia is one of the highest in Europe. In Slovenia there were a few epidemiological studies on drinking habits among adult population, but none of them has used the AUDIT questionnaire or the Internet for research.

Objective. The aim of this study was to analyse the drinking habits of the visitors of our website www.nalijem.si, which included an anonymous questionnaire for self-assessment of alcohol drinking.

Methods. A cross sectional survey was conducted between January 2010 and December 2013. The front page of our website included an invitation to fill in the anonymous web-based questionnaire; a part of it was the AUDIT 10 questionnaire. Everyone who filled in the questionnaire completely received an individualized feedback on his drinking.

Results. 54.020 persons visited our website, 15.817 (29.3%) of them started to fill in the questionnaire, 12.800 (80.9%) filled it in completely. In the analysis, 9.087 (71.0%) persons were included who completed the questionnaire for themselves. There were 37.1% (N=3.373) women and 62.9% (N=5.714) men. The average age was 33 years, the majority was employed (59.7%, N=5.222). The minority drank alcohol 2-4 times per month (32.8%, N=2.977) and most of them (64.5%, N=5.869) drank more than 3 units of alcohol per one occasion on a typical day. The average AUDIT 10 score was 11.7 for men, 8.1 for women.

Conclusions. A large percentage of participants were identified as hazardous and harmful drinkers, which should be a matter of serious concern.

Keywords:
websites, anonymous AUDIT questionnaires, personalized feedbacks

IZVLEČEK

Izhodišče. *Poraba alkohola je v Sloveniji med največjimi v Evropi. V Sloveniji je malo epidemioloških raziskav o pitju alkohola med odraslo populacijo, nobena od njih pa ni uporabila vprašalnika AUDIT ali bila opravljena po internetu.*

Namen. *Namen naše raziskave je bil ugotoviti pivske navade obiskovalcev naše spletne strani www.nalijem.si, ki vključuje tudi anonimni vprašalnik za samooceno pitja alkohola in individualizirano spletno povratno sporočilo o pitju obiskovalca.*

Metode. *Pregledna presečna raziskava je potekala od januarja 2010 do decembra 2013. Na prvi strani naše spletne strani je bilo povabilo za izpolnjevanje anonimnega spletnega vprašalnika o pitju alkohola, katerega del je bil vprašalnik AUDIT. Vsak obiskovalec, ki je v celoti izpolnil vprašalnik, je prejel individualizirano povratno sporočilo o svojem pitju.*

Rezultati. *Našo internetno stran je obiskalo 54.020 obiskovalcev, 15.817 (29,3%) se jih je odločilo reševati spletni vprašalnik, 12.800 (80,9%) obiskovalcev je rešilo celotni vprašalnik. V analizo je bilo vključenih 9.087 (71,0%) preiskovancev, ki so rešili vprašalnik v celoti in za sebe. Bilo je 37,1% (N=3,373) žensk in 62,9% (N=5,714) moških. Povprečna starost je bila 33 let, večina obiskovalcev je bila zaposlena (59,7%, N=5,222). Večina je pila alkoholne pijače 2- do 4-krat na mesec (32,8%, N=2,977), 64,5% (N=5,869) preiskovancev je pilo 3 ali več meric alkohola ob eni priložnosti, kadar so pili. Povprečni seštevek AUDIT je bil 11,7 za moške in 8,1 za ženske.*

Zaključek. *Velik delež obiskovalcev smo identificirali kot tvegane in škodljive pivce alkohola, kar je zaskrbljujoče.*

Ključne besede:
spletni anonimni vprašalniki AUDIT, individualna povratna sporočila

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1 INTRODUCTION

Alcohol is the second leading risk factor for diseases and premature death in Europe and it is related to more than 60 different diseases and injuries (1-3). It is also responsible for social, mental and emotional damage in the population, including accidents, crime and domestic violence, all of which lead to very high social costs (4). The registered yearly alcohol consumption in Slovenia is from 10.3 to 13.5 litres of pure alcohol per person aged over 15 years or more; in addition, there is 5-7 litres of unregistered consumption, which is 2.5 times more than the world's average (2, 5).

Preventive activities addressing the hazardous and harmful drinking should be routinely performed in primary health care; however, they are not frequent: doctors and nurses often avoid them because of a lack of time and training, the fear of worsening the doctor - patient relationship, and the belief that people are not susceptible to brief interventions (6). Although a large percentage of family doctors try to implement the screening for alcohol consumption into their daily practice, the actual results of screening are low (7). Patients themselves say that their physicians rarely ask them about alcohol drinking, even if it is for the people who drink hazardously or harmfully, or are addicted to alcohol (8-10). The fact that the majority of hazardous and harmful drinkers are not recognized by their physicians (11) shows the necessity of different approaches to their identification, and one of them can be the employment of the Internet.

In Slovenia, there were a few epidemiological studies on drinking habits among adult population between 2000 and 2010. The Countrywide Integrated Non-communicable Diseases Intervention – CINDI and European Health Interview Survey - EHIS showed that the number of abstainers was increasing and the number of risky drinkers was decreasing. The number of less risky drinkers was stabile (12, 13).

Website questionnaires have many potential advantages over questionnaires in paper form: they are accessible free of charge, 24 hours a day, from home or another location, are not locally dependent, they provide anonymity and access control, immediate feedback to users, automatic data recording with fewer transcription errors, interactive learning, quick data analysis and low long-term costs (14-16). The most apparent disadvantage of web-based questionnaires is limited access to a computer or World-Wide-Web, which appears to be a problem in lower social classes. According to research of MOSS (measuring thevisits ofwebsites), the Internet was used by 70% of Slovenian population (aged 10-74) in the first four months of the year 2012 (17). 49% of Slovenian web users were interested in information related to health. The majority of them were aged between 25 and 44 years (48%) and they were mostly women (58%).

Studies in different countries have shown that an anonymous survey and the provision of appropriate information through the Internet was more acceptable to many hazardous and harmful drinkers of alcohol than traditional ways of monitoring and providing information, and that they could even be useful for the improvement of their health (18, 19). Young people, who are, according to many studies, at higher risk of alcohol abuse (20-22), prefer to use new communication technologies to traditional methods of health promotion (23). Through an interactive website it was possible to reach groups of people who avoided or did not need consultations with their doctors. Although a web-based delivery of information was not as effective as a personal consultation with a doctor, those who drank hazardously or harmfully often did not come to the doctor or did not talk about it with him or her anyway (24, 25).

The aim of our study was to analyse drinking habits of the visitors of an interactive website, which in addition to informative, educational and counselling content on alcohol issues includes also a questionnaire for self-assessment of alcohol drinking.

2 PATIENTS AND METHODS

A cross sectional survey was conducted between January 2010 and December 2013. On a free website www.nalijem.si, an innovative questionnaire for self-assessment of alcohol (Supplementary files) consumption was installed. The questionnaire was designed by Marko Kolšek (Slovenia) in collaboration with Kypros Kypri (Australia) and John A. Cunningham (Canada), based on experiences of the authors of the website www.CheckYourDrinking.net and experiences partly described by Hallett et al. (26). The questionnaire was partly translated, partly modified and some new questions were added to it. It contained demographic data (gender, age, weight, education, and marital status), questions about drinking habits, the experience and consequences of drinking; altogether, there were 28 questions. The front page of our website included an invitation to fill in the anonymous questionnaire for self-assessment of alcohol drinking. Everyone who filled in the questionnaire completely received an individualized feedback with the AUDIT score and recommendations about their drinking according to their answers. Recommendations were different for hazardous and harmful drinkers, or for a person who could be addicted (e.g. explanation of low risk drinking limits, advice to cut down drinking, advice to read other topics at our website, to read a self-help booklet to cut down, advice to talk with their doctors, advice to seek help, etc.). The information about the website was spread by means of mass media, several websites, and some public events and exhibitions.

As the screening method for identification of hazardous or harmful drinking, the AUDIT questionnaire (Alcohol Use Disorder Identification Test) was used, which contains 10 questions and is considered as the gold standard questionnaire to screen for hazardous, harmful drinking and alcohol addiction (27). It has been developed by the World Health Organization (WHO) for the primary health care. Drinkers were classified according to the recommendations explained in the original WHO publication: AUDIT score 1-7 = low risk drinker, 8-15 = hazardous drinker, 16-19 = harmful drinker, 20 and over = addiction.

In this period 54.020 persons visited our website and 15.817 (29.3%) of them started to fill in the questionnaire. 12.800 (23.7%) visitors filled it in completely. 9.087 (71.0%) respondents aged between 10 and 99 years, who filled in all the questions and answered the questionnaire for themselves, were analysed, because other 3.813 responders indicated that they had completed the questionnaire for somebody else or just out of curiosity.

The data were statistically analysed using the SPSS 21.0 package (SPSS Inc., Chicago, IL). We calculated the descriptive data. In the bivariate analysis, we used the independent t-test to determine the differences between the means of two interval variables; Pearson Chi-Square test was used to determine the differences between nominal variables. In the analysis pertaining to sex of the participants and the AUDIT score, their age and the AUDIT score and their level of education and the AUDIT score, we used the ANOVA test to determine if a statistically significant relationship existed between particular demographic characteristics and the likelihood of AUDIT score. Tests were performed at the significance level of $p<0.05$.

The study was approved by the National Medical Ethical Committee on April 14th, 2009 (No 107/04/09).

3 RESULTS

9.087 of our website visitors filled in the whole questionnaire for themselves between January 2010 and December 2013; of those 37.1% (N=3.373) were women and 62.9% (N=5.714) men. The average age was 33 years (from 10 to 99 years), with 61.6% (N=5.600) under 36 years of age. Mostly they were single (33.2%, N=2.944) and finished secondary school (43.8% N=3.918). As for their employment status, more than half of respondents were employed (59.5%, N=5.222), followed by students (22.5%, N=1977).

The drinking habits of respondents on a typical day, when they were drinking, was 3-4 units of alcohol (24.4%, N=2.218), whereas 40.1% (N=3.651) of respondents drank more than 5 units a day (Table 1). Men drank 7 units or more (27.4% (N=1563)), whilst women drank mostly 0-1 units of alcohol per day (25.2% (N=850)); the differences are statistically significant (χ^2=510.513, $p<0.05$).

Table 1. Units of alcohol drunk per occasion on a typical day when they were drinking.

Units of alcohol	Number (%) of men	Number (%) of women	Total: Number (%)
0-1 unit	618 (10.8)	850 (25.2)	1.468 (16.2)
1-2	983 (17.2)	767 (22.7)	1.750 (19.3)
3-4	1.436 (25.1)	782 (23.2)	2.218 (24.4)
5-6	1.114 (19.5)	516 (15.3)	1.630 (17.9)
7 or more	1.563 (27.4)	458 (13.6)	2.021 (22.2)
Total: Number (%)	5.714 (100.0)	3.373 (100.0)	9.087 (100.0)

The majority of the respondents drank alcohol 2 - 4 times per month (32.8%, N=2.977), whereas 3.5% (N=322) were abstainers (Table 2).

Table 2. The frequency of drinking alcoholic beverages in the last 12 months.

The frequency of alcohol drinking	The frequency of drinking alcohol No. (%)	The frequency of men drinking 6 or more units per occasion No. (%)	The frequency of women drinking 4 or more units per occasion No. (%)
Never	322 (3.5)	813 (14.2)	938 (27.8)
Once or less per month	1.357 (14.9)	1.893 (33.2)	1.281 (38.0)
2-4 times per month	2.977 (32.8)	1.883 (33.0)	793 (23.5)
2-3 times per week	2.484 (27.4)	735 (12.9)	227 (6.8)
4 or more times per week	1.947 (21.4)	385 (6.7%)	132 (3.9)
Total	9.087 (100.0)	5.709 (100.0)	3.371 (100.0)

In the last year, 33.2% (N=1.893) of men drank once or less per month, more than 6 units on one occasion, while 33.0% (N=1.883) of them drank 2-4 times per month (Table 2). Women drank 4 units or more on one occasion, mostly once a month or less (38.0%, N=1.281); however, 10.7% (N=359) drank ≥ 4 units 2 or more times per week and drank hazardously or harmfully (Table 2).

The study also showed negative consequences and risky behaviour as a result of drinking during the past year: 28.2% (N=2.564) of respondents had problems in partnership and 24.7% (N=2.240) had problems at studying and at work because of their drinking. Half of male

Table 3. The type of drinking according to AUDIT 10 score by sex.

The frequency of alcohol drinking	Abstinent AUDIT= 0	Low risk AUDIT=1-7	Hazardous AUDIT= 8-15	Harmful AUDIT=16-19	Addicted AUDIT≥20	Total
Men count	124	1810	1992	858	925	5709
% within sex	2.2%	31.7%	34.9%	15.0%	16.2%	100.0%
Womencount	144	1821	879	270	257	3371
% within sex	4.3%	54.0%	26.1%	8.0%	7.6%	100.0%
Total count	268	3631	2871	1128	1182	9080
% within sex	3.0%	40.0%	31.6%	12.4%	13.0%	100.0%

(50.5%, N=2.885) and 20% (N=676) of female respondents were drinking and driving, the difference between the sexes is statistically significant (χ^2=8.26, p<0.05). 47.0% (N=4.269) of respondents had to take care of someone who was drunk.

36.3% (N=3.296) of respondents thought that their drinking was not good for their health. 40.6% (N=2.319) of them were men and 29% (N=977) women, the difference is statistically significant (χ^2=1.24, p<0.05). Respondents thought that their drinking had an influence on their satisfaction in 27% (N=2.457), of which 30.9% were male (N=1.766) and 20.5% female (N=691); the difference is statistically significant (χ^2=1.17, p<0.05).

The average AUDIT score was 10.4 (11.8 for men and 8.1 for women). According to the AUDIT questionnaire, 31.7% (N=1.810) of men and 54% (N=1.821) of women drank at low risk, on the other hand 41.7% (N=1.406) of women and 66% (N=3.775) of men drank hazardously, harmfully or were addicted to alcohol (Table 3). The differences between men and women are statistically significant (χ^2=5.516, p<0.05).

There are significant differences according to AUDIT score between age groups in men (F=12.9, p<0.05) and also in women (F=6.94, p<0.05) (Table 4). Women had higher AUDIT score in the group 65 years and over (m=9.0) and the lowest score in the group 25-35 years (m=7.4). Men had the highest AUDIT score in the group 18-24 years (m=12.6) and 25-35 years (m=12.1). The lowest score had the group 56 years of age and more (m=9.7)

In both sexes the AUDIT score decreased with the higher degree of education (Table 4); the difference is statistically significant (female AUDIT F=8.524, p<0.05; male AUDIT F=27.589, p<0.05).

Men and women had the highest AUDIT score when they drank 7 units or more per occasion (m=16.8 and m=18.1); the difference is statistically significant (female AUDIT F=915.604, p<0.05; male AUDIT F=1210.433, p<0.05) (Table 4). Smokers had significantly higher AUDIT scores

Table 4. Differences according to the average AUDIT 10 score between age groups, educational groups and drunk units of alcohol in men and women.

					95% confidence interval for mean	
		N	Mean AUDIT score	std. deviation	Lower bound	Upper bound
Age group						
10-17 years	Women	213	8.74	7.344	7.75	9.73
	Men	196	10.89	6.852	9.93	11.86
18-24 years	Women	1062	8.74	6.021	8.38	9.11
	Men	1225	12.59	6.960	12.2	12.98
25-35 years	Women	991	7.41	6.570	7.00	7.82
	Men	1909	12.06	7.455	11.73	12.40
36-55 years	Women	959	7.66	7.343	7.19	8.12
	Men	2006	11.46	7.798	11.12	11.80
<56 years	Women	146	8.95	8.766	7.52	10.39
	Men	373	9.73	7.821	8.94	10.53
Total	Women	3371	8.05	6.819	7.82	8.28
	Men	5709	11.77	7.512	11.58	11.97

					95% confidence interval for mean	
		N	Mean AUDIT score	std. deviation	Lower bound	Upper bound
Educational group						
Without primary school	Women	17	13.82	11.770	7.77	19.88
	Men	35	19.09	13.107	14.58	23.59
Primary school	Women	43	8.64	7.196	7.45	9.83
	Men	275	13.93	8.042	12.98	14.89
Vocational school	Women	159	8.43	7.853	7.20	9.66
	Men	629	13.87	8.578	13.20	14.54
Secondary school	Women	1.484	8.66	6.822	8.31	9.00
	Men	2.431	11.89	7.279	11.60	12.18
College	Women	276	7.26	6.913	6.44	8.08
	Men	548	11.40	7.551	10.77	12.03
University	Women	1.091	7.17	5.972	6.81	7.52
	Men	1.491	10.52	6.610	10.18	10.85
Master's or doctor's degree	Women	139	7.21	7.573	5.94	8.48
	Men	231	10.07	7.615	9.09	11.06
Total	Women	3.309	8.00	6.746	7.77	8.23
	Men	5.640	11.77	7.500	11.57	11.96
Units of alcohol						
0-1 unit	Women	850	2.25	2.488	2.09	2.42
	Men	617	2.71	2.925	2.57	2.94
2 units	Women	767	5.30	3.297	5.06	5.53
	Men	981	6.60	3.630	6.37	6.82
3-4 units	Women	781	8.77	4.886	8.42	9.11
	Men	1436	10.51	5.118	10.24	10.77
5-6 units	Women	516	12.90	5.872	12.39	13.41
	Men	1113	14.12	5.891	13.78	14.47
7 units or more	Women	457	16.77	7.417	16.09	17.45
	Men	1562	18.09	7.151	17.74	18.45
Total	Women	3371	8.05	6.819	7.82	8.28
	Men	5709	11.77	7.512	11.58	11.97

than non-smokers in both sexes: women (10.6 vs. 6.4, t=-18.63; p<0.05) and men (14.1 vs. 10.1; t=-20.791, p<0.05); in addition, they more often drank 7 units or more (31.3%, N=1.169), whereas non-smokers mostly drank 3-4 units on one occasion (24.6%, N=1.320). The difference is statistically significant (χ^2=596.58, p<0.05).

4 DISCUSSION

The main aim of this research was to analyse drinking habits and to identify hazardous and harmful drinkers with a web-based questionnaire.

In Slovenia, only a few studies about drinking habits have been carried out and none of them used a web-based questionnaire as the method of data gathering. We were surprised by the great number of responders to the questionnaire (although the questionnaire contains 28 questions), which can probably be attributed to the respondents' desire or curiosity to learn something about their alcohol consumption without being exposed to a personal contact with medical professionals. In studies from the United States (28) and Spain (29) in which the full AUDIT questionnaire was used, a much smaller proportion of participants on the website completed the entire questionnaire.

Website as the screening method can capture a greater proportion of population that is not covered by traditional screening methods (especially younger population). Most of previous studies using web-based questionnaire were carried out on the population of university students (26, 30), whereas in our study a much broader population was included (the average age was 33 years).

The average AUDIT score for all responders in our study was 10.4, which shows that many of the responders may were among hazardous, harmful drinkers or even addicted to alcohol. However, this score is much smaller than in a similar study in New Zealand (16.6 points) (30), which is probably due to student population that was included in their study.

The proportion of men and women, who drank hazardously or harmfully, in our study, differs to a great extent from the studies in some other countries (31, 32), as well as from other Slovenian studies, where up to 52.5% of men were found to be harmful or hazardous drinkers, while our study shows 66.1% of men as harmful or hazardous drinkers (3); an even bigger difference was noticeable among women (41.7% vs.16.5%) (5, 12, 13, 33, 34). The most probable reason for this difference is the anonymity provided by the website questionnaire in contrast to a paper or telephone version in the previous studies. The reason could also be the inclusion of a larger proportion of a younger age group and the use of the AUDIT-C questionnaire in contrast to the AUDIT-10 in our study.

The highest AUDIT score was, in the group of 56 years of age and more, in women (9.0), whereas in men it was in the group 18-24 years of age (12.6). Elderly men (56 years and more) had a higher AUDIT score (9.7) than elderly women. Already O'Connell et al. concluded in their study that alcohol abuse is common in the elderly. Since elderly patients tend to take more medications, there may be an increased risk of drug-alcohol interaction (35). The lowest AUDIT score in women was in the group between 25 and 35 years of age (7.41), which can be explained by the fact that in this age group women can be pregnant and they drink less accordingly.

In our study, the AUDIT score was significantly higher in the group of smokers (11.48) than in non-smokers (7.76). Similar results were found by Meyerhoff et al. (36), who recommended to intensify alcohol screening among those who smoke, because addictions to alcohol and nicotine are often comorbid addictions.

In both sexes, the AUDIT score decreased with the higher degree of education; as in other Slovenian studies (13), the majority of risky drinkers had a low level of education (a finished vocational school or less).

Men and women had the highest AUDIT score (16.7 for women and 18.1 for men) when they drank 7 units of alcohol or more per occasion, which indicates that the AUDIT questionnaire could detect occasional heavy drinkers (binge drinkers). Likewise, in the study by Tuunanen (37), it was showed that the AUDIT questionnaire is effective in detecting binge drinking, if the cut-off point for the AUDIT score is ≥7. However, authors stated that the AUDIT questionnaire is applicable only to populations in which binging is the dominant drinking pattern. The correlation between a high AUDIT score and heavy occasional drinking could indicate that, in Slovenian population, binging is the dominant drinking pattern. On the other hand, it could be the result of study population of younger average age. However, further studies are needed to confirm this.

There are some limitations of our study. Due to the nature of websites and anonymity, we cannot determine whether almost one-third of participants who did not complete the whole questionnaire had the same drinking habits as those who did it. Our results also cannot be generalized to the whole Slovenian population because the visitors of our website probably are not the representative sample.

5 CONCLUSIONS

The results of our research cannot be generalized to the whole Slovenian population; nonetheless, a high AUDIT score in the male group of 18-24 years of age and in the female group above 56 years of age should be a trigger for alarm. The Internet (i.e. the website) has proven to be a well-accepted methodological tool, especially for young people, as well as a new means of warning and educating population about alcohol drinking habits and encouraging the reduction of alcohol consumption.

CONFLICTS OF INTEREST

The authors declare that no conflicts of interest exist.

FUNDING

The study was not funded.

ETHICAL APPROVAL

The study was approved by the National Medical Ethical Committee on April 14th, 2009 (No 107/04/09).

SUPPLEMENTARY FILES

http://www.nalijem.si/vprasalnik_za_samooceno_pitja/vprasalnik/

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