



Does higher alcohol consumption affect attitudes towards alcohol control measures in Estonia?

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ABSTRACT

Objectives: To analyze whether higher alcohol consumption is associated with negative attitudes towards stricter alcohol control policy measures in Estonia.

Study design: Cross-sectional analysis of nationally representative data from 2022 (n = 2059).

Methods: Attitudes towards seven alcohol control measures and their association with high-risk alcohol consumption (>140 g absolute alcohol for men and >70 g for women per week) were analyzed using used descriptive statistics and binary logistic regression using nationally representative data on Estonian 15–74-year-old population.

Results: In general, high-risk consumption associated with lower acceptance for alcohol control policies. Although men had higher prevalence of opposing alcohol control measure for every item considered, both men and women with high-risk alcohol consumption were significantly more likely to be against alcohol control measures in general even after accounting for the variation by demographic characteristics.

Conclusions: As public opinion is detrimental to the successful implementation of alcohol policies, these findings emphasize the need to communicate alcohol-related harms to the public in order to increase awareness and support for alcohol control policies.

1. Introduction

Alcohol policy is paramount in reducing alcohol-related harms. Making alcohol more expensive via taxation, restricting the physical availability of alcoholic beverages and limiting the exposure to alcohol advertising are examples of policies that have proven effective by extensive evidence from systematic reviews and meta-analyses [1,2]. However, both public opinion and individual attitudes might potentially hinder the implementation of these policy measures. Individual attitudes, central to many theories of health behavior, could affect the level of support for measures aimed at reducing alcohol-related harms but also influence individual alcohol consumption [3]. Therefore, it is important to understand and address the attitudes related to alcohol policy to effectively reduce the harm associated with alcohol use.

Within Europe, alcohol attributable harms have been especially pronounced in Eastern-European countries [4] where application of alcohol policy measures until recently has been inconsistent, even though this has changed in some countries such as Lithuania in the past decade [5]. Although evidence on the association between consumption and attitudes towards alcohol control measures in this region is limited, an earlier comparative study [6] has demonstrated that Eastern-European countries have the lowest support for alcohol control measures within the European Union.

This study focuses on Estonia where relatively liberal alcohol policy of the 1990s has over the past two decades witnessed several significant changes. Estonian alcohol control legislation has gradually evolved to include most evidence-based measures to reduce the harmful use of alcohol with focus on taxation and limitations in physical availability

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and advertisements. Despite the continued efforts, several “best buy” measures such as inflation-adjusted tax, ban on internet and social media advertising, prohibition of alcohol sales in gas stations etc. are not implemented and the alcohol is relatively highly available in Estonia [5, 7]. Given the importance of attitudes in the policy context, the overall aim of the study is to fill the evidence-gap on the individual attitudes related to alcohol control measures in the region by analyzing the associations between alcohol consumption and individual attitudes towards potential alcohol control measures in Estonia.

2. Methods

Our study uses nationally representative data from the survey Attitudes and opinions on alcohol consumption as a cross-sectional mixed mode (postal and web) survey in late 2022. The survey was based on a sex and age stratified random sample ($n = 5000$) of 15–74-year-old Estonian residents drawn from Population Registry. In total, 2059 individuals completed the survey (adjusted response rate 41.9 %) and were included in the dataset used in current study.

Attitudes towards alcohol policy were covered by six Likert-styled items on various alcohol control measures. These include: a) Implementing warning labels referring to adding markings/warning texts “Alcohol might cause cancer” to alcoholic drink containers, b) Increasing legal drinking age to 21 years, c) Prohibition of web advertisement of alcohol, d) Stricter punishments for alcohol sale to underage or intoxicated persons, e) Prohibition of alcohol sales in gas stations, d) Further availability restrictions in alcohol point-of-sale locations and allowed alcohol sale hours. For each item, the initial four-item scale was dichotomized for the analysis into categories of a) do not agree (do not agree at all, rather don’t agree) and b) agree (rather agree, totally agree). Based on these items, an additional summary variable was calculated distinguishing groups who: a) disagree with ≥ 3 and b) disagree with ≤ 2 alcohol control measures. All these measures are currently not implemented or used in less restrictive manner in Estonia.

Individual alcohol consumption was calculated based on self-reported data on the quantity of beer, wine, liquors, and light alcoholic drinks consumed during the past 7 days. Total consumption of alcohol was estimated using the number of drinks, standardized drink size and ethanol density (0.7893 g/cm^3) and presented as grams of absolute alcohol consumed. Following national guidelines, a separate variable was calculated distinguishing: a) low risk consumption ($\leq 140 \text{ g}$ for men and $\leq 70 \text{ g}$ for women per week) and b) high-risk consumption ($>140 \text{ g}$ for men and $>70 \text{ g}$ for women).

For each alcohol control measure, the total number of respondents and prevalence rate of opposing the measure with 95 % confidence intervals (95 % CI) is presented. Binary logistic regression (predicting not agreeing with policy measure) were run for each statement as both univariate and adjusted models. In the latter, demographic variables of age (15–29, 30–44, 45–59, and 60–74 years), education (primary or less, secondary, or vocational, tertiary) and ethnicity (Estonian, non-Estonian) were included to the models to account for potential confounding due to demographic patterning of both attitudes and alcohol consumption. Results are presented as odds ratios (OR) with 95 % CI for high-risk consumption using low risk consumption as a reference category. All analyses were carried out separately for men and women and used weighted data to account for the non-response bias of the survey. Statistical analyses were conducted using IBM SPSS Statistics for Windows, Version 29.0.

3. Results

The prevalence of self-reported high-risk alcohol consumption in Estonian population was 16.0 % (95 % CI 14.3–17.9 %) but varied statistically significantly between men (19.7 %, 95 % CI 17.0–22.5 %) and women (12.2 %, 95 % CI 10.0–14.6 %). The overall findings from

the analysis (Table 1) indicate that high-risk consumption was associated with less approval for alcohol control policies for both men and women but not all associations were statistically significant.

In univariate regression model, attitudes regarding alcohol control measures were more profoundly differentiated by individual alcohol consumption for women than for men. Compared to low-risk alcohol consumers, women consuming $>70 \text{ g}$ of absolute alcohol per week (i.e., high-risk consumption) had more than two-fold odds for being against all alcohol control measures except for implementation of warning labels. For men, statistically significant differences in attitudes by alcohol consumption were found for implementing warning labels (OR 1.59), prohibition of web advertisements (OR 1.81), stricter punishments for alcohol sale (OR 1.92), and prohibiting alcohol sales in gas stations (OR 1.54). For both men and women, those with high-risk alcohol consumption were significantly more likely to be against alcohol control measures (i.e., oppose ≥ 3 policy measures) in general.

The effects of alcohol consumption on policy attitudes were slightly attenuated in multivariate regression models controlling for age, education, and ethnicity. Statistically significant differences in attitudes between high-vs. low-risk consumption in men were present for warning labels (OR 1,56), prohibition of web advertisements (OR 1,76) and stricter punishments for alcohol sale (OR 1,83). For women, risk consumption differentiated only the attitudes towards prohibition of web advertisements (OR 1,84) and prohibition of alcohol in gas stations (OR 2,19) in adjusted model. However, the effects of high-risk alcohol consumption persisted for both men (OR 1,66) and women (OR 1,86)

Table 1

Prevalence of respondents opposing alcohol control measures and its association with alcohol consumption levels among Estonian 18–74-year-old population by gender.

	Total population		High vs. Low alcohol consumption	
	Count	Opposing measure	Unadjusted model	Adjusted model
	n	% (95 % CI)	OR (95 % CI)	OR (95 % CI)
Men				
Implementing warning labels	753	53.4 (49.8–56.9)	1.59 (1.03–2.45)*	1.56 (1.00–2.41)*
Increasing legal drinking age to 21y	846	45.3 (41.9–48.6)	1.22 (0.83–1.79)	1.11 (0.73–1.67)
Prohibition of web advertisements	831	27.5 (24.5–30.5)	1.81 (1.21–2.70)**	1.76 (1.15–2.68)**
Stricter punishments for alcohol sale	818	17.0 (14.5–19.7)	1.92 (1.21–3.05)**	1.83 (1.13–2.99)*
Prohibiting alcohol sales in gas stations	825	43.7 (40.3–47.0)	1.54 (1.04–2.26)*	1.39 (0.93–2.09)
Availability restrictions	801	63.8 (60.4–67.1)	1.21 (0.78–1.87)	1.10 (0.70–1.75)
Opposing ≥ 3 policy measures	899	42.9 (39.6–46.1)	1.76 (1.20–2.59)**	1.66 (1.11–2.49)**
Women				
Implementing warning labels	764	38.7 (35.3–42.2)	1.14 (0.69–1.89)	1.21 (0.71–2.04)
Increasing legal drinking age to 21y	864	31.2 (28.2–34.4)	2.29 (1.42–3.70)***	1.63 (0.95–2.80)
Prohibition of web advertisements	889	13.1 (11.0–15.4)	2.38 (1.34–4.24)**	1.84 (1.00–3.38)*
Stricter punishments for alcohol sale	887	8.0 (6.4–9.9)	2.46 (1.28–4.74)**	1.70 (0.82–3.53)
Prohibiting alcohol sales in gas stations	853	22.4 (19.7–25.3)	2.86 (1.75–4.65)***	2.19 (1.31–3.67)**
Availability restrictions	834	39.9 (36.6–43.3)	2.01 (1.22–3.29)**	1.51 (0.89–2.56)
Opposing ≥ 3 policy measures	962	20.9 (18.4–23.5)	2.53 (1.57–4.07)***	1.86 (1.12–3.09)**

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

regarding the item of opposing ≥ 3 policy measures in the adjusted model.

4. Discussion

Approximately every sixth person aged 15 or older in Estonia reports high alcohol consumption defined as ≥ 14 standard drinks for men and ≥ 7 for women per week. Although men had universally lower acceptance for alcohol control measures, both men and women with high-risk alcohol consumption were significantly more likely to be against alcohol control measures in general even after accounting for the variation by demographic characteristics.

These findings correspond to earlier evidence [6,8], where high alcohol consumers have found to be least supportive for policy measures. This is to be expected, as alcohol control measures would affect this population group the most. On the other hand, the health gains of reducing alcohol consumption are clustered on the sub-population with high-alcohol consumption as demonstrated by Wood et al. [9], where the long-term reduction of alcohol consumption from 196 g per week to ≤ 100 g per week would result in 1–2 years of longer life expectancy at the age of 40. Given that men have substantially higher average alcohol consumption compared to women (104 vs. 31 g per week in our data), the significantly lower support for alcohol control policies among men warrants further attention as the knowledge about alcohol-related harm is shown to predict changes in attitudes [10] and also the support for alcohol policies is greater among individuals who are aware of alcohol-related harms [11].

In addition to alcohol consumption, the demographic patterns also affected attitudes. Similarly to findings from Li et al. [8], those who were younger or had lower education tended to be less supportive for alcohol control measures (data not shown). Also, ethnic Estonians tended in general to be less supportive towards alcohol control measures than non-Estonians. This contrasts the earlier data on considerable ethnic inequalities in alcohol-related mortality in Estonia [12] and highlights the need for further in-depth studies on socio-demographic variations in alcohol-related attitudes and harms.

These findings should be interpreted with considerations for potential limitations in the study design and data. First, the study is based on cross-sectional data that does not allow establishing causality between alcohol consumption and policy-related attitudes. Also, the operationalization of indicators, especially in case of alcohol consumption indicator may have affected the results due to reporting bias. Its effect is likely to be limited as additional sensitivity analysis using frequency-based alcohol consumption indicators (data not shown) did not alter the main results. Although survey response rate was relatively low with both age and sex-specific response bias present, post-stratification weights were applied to assure representativeness of the data.

This paper contributes to the studies on attitudes toward alcohol policies which are scarce in most European countries. As individual attitudes and public opinion in general is often detrimental to the successful implementation of alcohol policies, these findings emphasize the need to communicate alcohol-related harms to the public to increase

awareness and support for alcohol control policies in the long run.

Ethics

The survey was approved by the Research Ethics Committee of National Institute for Health Development (approval no. 1072, 27.04.2022).

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- [1] P. Anderson, D. Chisholm, D.C. Fuhr, Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol, *Lancet* 373 (2009) 2234–2246.
- [2] N. Siegfried, C. Parry, Do alcohol control policies work? An umbrella review and quality assessment of systematic reviews of alcohol control interventions (2006–2017), *PLoS One* 14 (2019) e0214865.
- [3] N. Giesbrecht, M. Livingston, Public perceptions and alcohol policies: six case studies that examine trends and interactions, *Drug Alcohol Rev.* 33 (2014) 217–219.
- [4] World Health Organization, Regional Office for Europe, Making the WHO European Region SAFER: Developments in Alcohol Control Policies, 2010–2019, World Health Organization, Regional Office for Europe, Copenhagen, 2021.
- [5] M. Neufeld, A. Bobrova, K. Davletov, M. Štelemėkas, R. Stoppel, C. Ferreira-Borges, et al., Alcohol control policies in Former Soviet Union countries: a narrative review of three decades of policy changes and their apparent effects, *Drug Alcohol Rev.* 40 (2021) 350–367.
- [6] C. Kilian, J. Manthey, J. Moskalewicz, J. Sieroslawski, J. Rehm, How attitudes toward alcohol policies differ across European countries: evidence from the standardized European alcohol survey (SEAS), *Int. J. Environ. Res. Publ. Health* 16 (2019).
- [7] K. Pärna, Alcohol consumption and alcohol policy in Estonia 2000–2017 in the context of Baltic and Nordic countries, *Drug Alcohol Rev.* 39 (2020) 797–804.
- [8] J. Li, M. Lovatt, D. Eadie, F. Dobbie, P. Meier, J. Holmes, et al., Public attitudes towards alcohol control policies in Scotland and England: results from a mixed-methods study, *Soc. Sci. Med.* 177 (2017) 177–189.
- [9] A.M. Wood, S. Kaptoge, A.S. Butterworth, P. Willeit, S. Warnakula, T. Bolton, et al., Risk thresholds for alcohol consumption: combined analysis of individual-participant data for 599 912 current drinkers in 83 prospective studies, *Lancet* 391 (2018) 1513–1523.
- [10] E.E. Storvoll, I.S. Moan, J. Rise, Predicting attitudes toward a restrictive alcohol policy: using a model of distal and proximal predictors, *Psychol. Addict. Behav.* 29 (2015) 492–499.
- [11] S. Bates, J. Holmes, L. Gavens, E.G. de Matos, J. Li, B. Ward, et al., Awareness of alcohol as a risk factor for cancer is associated with public support for alcohol policies, *BMC Publ. Health* 18 (2018) 688.
- [12] K. Rahu, K. Pärna, E. Palo, M. Rahu, Contrasts in alcohol-related mortality in Estonia: education and ethnicity, *Alcohol Alcohol* 44 (2009) 517–522.