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Regrets, I've Had a Few: Exploring Factors Associated with Getting Drunk and Regret in an International Study of People Who Drink Alcohol

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ABSTRACT

Background: Excessive alcohol consumption is often followed by feelings of regret. This study aimed to explore country differences in experiences of drunkenness and regrets and predictors of experiencing a greater number of regrettable drinking occasions.
Methods: This study draws on a sample of 82,821 respondents from 31 countries who completed the 2020 Global Drug Survey. Respondents were asked to report how many times in the last year they had been drunk, how many of those times they felt regret afterwards and to complete a range of sociodemographic measures.
Results: In the last 12 months, the median times drunk was 6 and the median number of regretted occasions was 2. There was an inverse relationship between times drunk and regret. Respondents who got drunk more often regretted it a smaller percentage of the time than those who got drunk less often. Respondents from Argentina and Colombia regretted being drunk the most and Denmark the least. Being younger, in higher AUDIT categories were associated with more times drunk. Being a woman, having mental health conditions were associated with more regretted occasions.
Discussion and conclusions: Country variations may reflect relative acceptability of being drunk. Those who drink more, per occasion, may become accustomed to the consequences and feel fewer regrets. Interventions promoting reduced alcohol consumption may benefit from encouraging people to consider their future regret following a drinking occasion but should account for lower levels of regret in those who get drunk more often.

Introduction

People consume alcohol for a wide range of purposes, including enhancing sociability; unwinding from the pressures of the working day; and reducing feelings of anxiety (Bresin & Mekawi, 2021; Foster & Neighbors, 2013; Measham & Brain, 2005). Alcohol consumption is a risk factor for global disease burden contributing to a range of significant health harms including liver disease, cancer and road injuries (GBD 2020 Alcohol Collaborators, 2022). These harms are not limited to the person using alcohol; other people may also suffer harm as a result of the drinking of others: such as alcohol-related violence or domestic abuse, property damage, alcohol-involved car crashes or impact on mental health (Bellis et al., 2015; Berends et al., 2014; Ferris et al., 2011; Laslett et al., 2010).

Many interventions aimed at reducing excessive alcohol consumption use informational approaches to draw attention to long-term health effects of drinking and outline "safer" levels of consumption (Burton et al., 2017; Furtwaengler & de Visser, 2013). Public health strategies, such as guidelines for low-risk drinking, are often perceived as lacking relevance to peoples' lives (Davies et al., 2022; Lovatt et al., 2015) and many people drink in excess of drinking guidelines in order to achieve the desired effects. In the 2015 Global Drug Survey (GDS) respondents were asked how much alcohol they would need to consume in order to experience their ideal level of intoxication (Davies et al., 2020). On average, they reported consuming almost double the upper limit recommended by governments or health organizations in most countries—at 87.55 gm for men and 70.16 gm for women—compared to a maximum of 40 gm recommend by some countries and significantly higher than the 60 gm defined as heavy episodic drinking by the World Health Organization (Davies et al., 2020; WHO, 2018). Moreover, twenty percent (20%) of respondents in the study said they exceeded their "tipping point"—that is they got more drunk than they wanted to be—at least once a month (Davies et al., 2020). In a qualitative study, the tipping point was described as an unwanted psychological and physical state, causing sickness, poor mood and the feeling of having lost control (Burgess et al., 2019). Excessive consumption with these kinds of consequences is often linked with feelings of regret (aversive outcomes of drinking) the day after the drinking occasion (Davies & Joshi, 2018).

Anticipated regret has been shown to add to the prediction of intentions in a variety of health domains (Brewer et al., 2016) including drinking alcohol (Cooke et al., 2007). In these studies people are asked if they would regret the act of getting drunk itself, and not specific consequences that might happen as a result. However, when examined in more detail, the relationship between drinking and regret appears to be complicated. In one study with young people aged 18–30 years, high risk drinkers experienced a greater number of negative consequences from their drinking, but reported lower levels of regret (Davies & Joshi, 2018). A replication of this study used ecological momentary assessment tools (Shiffman, 2009) to ask people to report how much regret they felt in the morning after a drinking occasion (Jones et al., 2020). The authors found that more common outcomes, such as having a hangover, vomiting, or feeling embarrassed were rated more regrettable than more serious consequences, such as missing work or unprotected sex (Jones et al., 2020).

Regret extends beyond acute intoxication related behaviors and can include evidence of the episode through posts on social media (Geusens & Vranken, 2021), as well as the physical and emotional consequences of hangovers (Milton et al., 2020). Strategies aiming to promote reduced alcohol use may benefit from highlighting alcohol related behaviors associated with regret and explore how these moderate the variation in the acceptability of public drunkenness across different countries. For example, feelings of regret may motivate some people to avoid being the "one who needs to be looked after" during a night out (Niland et al., 2013). Furthermore, if low risk alcohol use guidelines are considered inconsistent with the desired effect many people wish to obtain from drinking, it may be that a focus on avoiding exceeding tipping point consumption and the associated regrets may be a potentially acceptability strategy to encourage less excessive alcohol reduction ("excess consumption in moderation"). In this sense, experiencing regrets may lead to behavior change as people attempt to avoid experiencing these feelings again in the future. Alternatively, encouraging people to consider possible future regrets may also lead to behavior change (Cooke et al., 2007). Adding support to this as a potential behavior change strategy, argument, a poster campaign focusing on embarrassing situations was rated as highly acceptable by US students (Gilkerson et al., 2013), and a focus on short term regrets was acceptable to UK students (Davies et al., 2017).

GDS has been exploring the relationship between alcohol, excessive consumption and motivations to drink less for several years. Initially we were interested in the frequency of getting drunk and the consequences that led to people thinking about drinking less. This early work identified marked regional variation, with respondents from Germany, and those aged over 35 being more likely to be impacted by social embarrassment (Davies et al., 2017). Mental health may also be negatively impacted by a higher prevalence of regret (Pedersen & Feroni, 2018). While the GDS2019 explored regret, the study was limited because we used did not clearly define what getting drunk was (important in a large multi-language study) while focusing on characterizing the nature of regrets (Davies et al., 2021). Thus, in GDS2020 survey we revised the question items to better understand predictors of frequency of getting drunk and regrets in a large international sample of people who drink alcohol.

Regrets are often observed by others and can be seen as form of socialized control, though the influence from peers, family or others on consumption behavior are likely to vary between country (Dietze et al., 2013). Country differences in experiences of regret may therefore arise from different social norms about the acceptability of public drunkenness as well as different attitudes drinking (Dietze et al., 2013; Savic et al., 2016). In some countries, including the UK and Australia, drinking is a hedonistic pastime (Room & Mäkelä, 2000). Alcohol consumption also varies between countries due to price and availability (Calvo et al., 2021). Thus, exploring country differences in experiences of regret would add to our understanding about cultural differences in alcohol consumptions patterns.

There are established links between alcohol consumption and depression (Boden & Fergusson, 2011), anxiety (Kushner et al., 1990), bi-polar disorder (Farren et al., 2012), and ADHD (Capusan et al., 2016) for example. Regrets may be experienced differently be people experiencing mental health and neurodevelopmental conditions because of how they interact in social situations and, perhaps, ruminate on their behavior during the drinking occasion.

Drawing on the data from the 2020 Global Drug Survey (GDS 2020), the study aims were to explore:

a. variations in experiences of getting drunk and regret stratified by country,
b. variations in getting drunk and regret by socio-demographic variables, mental health status and risk of alcohol dependence.

Methods

Design and procedure

The GDS is an anonymous, online, cross sectional survey, which usually launches in November each year, with data released the following May. GDS2020 ran from November 2019 to January 2020 and was translated into 19 languages (English, Albanian, Azerbaijani, Brazil, Czech, Danish, Dutch, Finnish, French, German, Hungarian, Italian, Lithuanian, Portuguese, Romanian, Serbian, Slovak, Spanish, and Turkish). Recruitment into GDS is facilitated by mainstream and social media and harm reduction organizations; see Winstock et al. (2022) for further details on recruitment and other methods. It is a non-probability survey, and not intended to be representative of the populations within the included countries. Nonetheless, it has been demonstrated that GDS recruits people who use alcohol and cannabis who are similar in age and gender to people completing general household surveys in Australia, the United States and Switzerland (Barratt et al., 2017). Ethical approval was obtained from the UCL Research Ethics Committee (11671/001: Global Drug Survey), The University of Queensland (2017001452) and The University of New South Wales (HREC HC17769) Research Ethics Committees.

Participants

There were 110,557 respondents to GDS2020. The sample for this study is restricted to those from countries where there were at least 250 respondents (to allow sufficient numbers for comparisons and to support multivariable analysis) and who had answered questions relating to alcohol drinking patterns, times drunk and alcohol-related regret.

Measures

GDS2020 used the Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 2001), a 10 item questionnaire used to assess risk of alcohol dependence. The scale ranges from 0 to 40 and respondents' classification of alcohol dependence—based on AUDIT scores—are categorized as lower risk (0–7), increasing risk (8–15), higher risk (16–19) and possible alcohol dependence (20+).

Mental health: Respondents were asked if they had a lifetime diagnosis of the following mental health conditions; depression; anxiety, bipolar disorder; psychosis; ADHD; post-traumatic stress disorder; or other.

Times drunk: Respondents were presented with the following definition:

> We define drunk as having drunk so much that your physical and mental faculties are impaired to the point your balance/speech may be affected, you are unable focus clearly on things and that your conversation, speech and behaviours are obviously different to normal.

They were then asked how many times they had got drunk in the last 12 months.

Regret: Those who reported getting drunk at least once in the past 12 months were asked:

> approximately how many times did you regret getting drunk? (regret means you wish you had drunk less or not drunk at all).

Hereafter this is referred to as "regret occasions".

GDS2020 also contained a broad range of demographic measures but for the purpose of this study we only include gender, age, and country of residence as these are known to be associated with drinking patterns and behaviors (GBD 2020 Alcohol Collaborators, 2022).

Analysis

Respondents who reported that they got drunk more than 365 times in the last 12 months were excluded (N = 3) as they were assumed to be erroneous responses. There were 1,052 respondents who reported a higher number of regrets than the number of times they got drunk. These were also excluded from the subsequent analyze relating to regret as they were assumed to be erroneous responses, (although it is possible that a respondent may feel regret more than once about the same drinking occasion, though the way the question was phrased should have avoided this). Data were then analyzed using descriptive statistics to explore country differences in socio-demographic characteristics, AUDIT scores, and the proportion of respondents with a mental health condition history. The proportion of respondents who said they never got drunk when drinking, and the median times drunk and regret occasions were explored by country. The percentage of occasions of regret was calculated taking the number of times regretted relative to the number of times drunk—e.g. five times regretted out of 50 times drunk = 10% of occasions someone got drunk was regretted. Hereafter this referred to as "regret percentage". Due to the skewness of the data, Spearman correlations and Kruskal Wallis tests were used to explore the bivariate associations between time drunk, regret occasions and regret percentage against gender, age, AUDIT score, and mental health. Significant Kruskal Wallis tests were explored with *post hoc* Mann Whitney tests applying a Bonferroni calculation to account for multiple comparison. Finally, predictors of the frequency (or count) of times drunk and regrets were analyzed with multi-level multivariable negative binomial regression models. Country was included as a random effect (intercept only), and gender, mental health, AUDIT categories, and age categories were entered as fixed effects.

Results

Descriptive statistics

The final sample included 82,821 respondents from 31 countries with a valid AUDIT score and response for the number of times they got drunk in the last year (see Table 1). Germany was the country with the most respondents (32.4% of the sample). Two thirds of the sample identified as male and 86.6% as white. The median age was 26 (p25 = 21; p75 = 34) and the median AUDIT score was eight (p25 = 5, p75 = 13) with expected variation between countries. Over a quarter of the sample (27.9%) reported ever having a mental health condition. Respondents from the United States (52.2%) and Finland (50.1%) were most likely to report a mental health condition history. Of the whole sample, 15.5% of last year drinkers said they had not been drunk in the last year. In the whole sample, the median times drunk per year was 6 (p25 = 2; p75 = 20).

Country comparisons of getting drunk and regrets

Respondents from Portugal (53.9%) were the most likely to indicate they had not been drunk whereas respondents from Australia (5%) were least likely to indicate they had not been drunk in the last year (Table 2). Figure 1 compares the median times drunk by respondents from different countries. Respondents from Denmark got drunk a median of 20 times in the last year. Those from England, Scotland and Australia got drunk, a median of 15 times in the last year. Comparatively, respondents from Argentina and Colombia reported getting drunk a median of once in the last year and those from Spain a median of twice in the last year (Figure 1).

The median number of regret occasions was 2 (p25 = 0; p75 = 5) with substantial variability in the 25th and 75th percentile values between countries (Table 2). The median

Table 1. Sociodemographic details (sex and age), median AUDIT scores, and mental health diagnosis in the study sample.

	N	%	% Male	Age Mdn*	Age (P25)	Age (p75)	AUDIT Mdn	AUDIT (P25)	AUDIT (P75)	Mental health condition Yes*	%
Total	82821	100	64.80%	26	21	34	8	5	13	17866	27.90
Argentina	1110	1.3	50.50%	23	20	27	6	4	10	112	15.24
Australia	7301	8.8	62.10%	20	18	25	10	7	14	1996	38.76
Austria	3750	4.5	62.50%	26	22	33	8	5	12	575	18.52
Belgium	441	0.5	62.40%	25	21	32	9	5	13	76	21.53
Brazil	4154	5	62.80%	25	21	30	9	6	13	1034	36.64
Canada	1211	1.5	66.10%	24	19	31	8	4	12	438	45.86
Colombia	1652	2	62.60%	23	21	27	8	5	12	212	19.56
Denmark	4492	5.4	62.10%	22	19	26	11	8	15	895	31.70
England	3375	4.1	61.80%	23	20	30	10	6	14	1012	38.19
Finland	2175	2.6	70.50%	25	20	33	10	6	15	913	50.05
France	1339	1.6	67.20%	28	23	38	8	5	13	186	17.25
Germany	26856	32.4	66.40%	28	23	37	7	4	12	4911	21.85
Greece	1179	1.4	64.50%	21	18	28	7	4	10	129	16.23
Hungary	2012	2.4	75.20%	26	21	34	7	4	11	195	12.07
Republic of Ireland	1644	2	60.50%	34	24	42	10	6	15	292	25.11
Italy	444	0.5	68.00%	24	20	30	7	4	12	44	12.72
Mexico	1258	1.5	66.10%	25	21	30	9	5	14	203	24.46
Netherlands	1214	1.5	64.20%	23	20	29	8	5	12	265	27.32
New Zealand	2817	3.4	61.20%	40	30	51	8	4	13	676	30.49
Norway	419	0.5	77.80%	28	23	35	8	4	12	107	30.66
Poland	256	0.3	73.00%	21	18	23	8	5	11	81	38.03
Portugal	1075	1.3	53.00%	27	22	35	8	4	11	158	19.53
Romania	329	0.4	62.30%	22	18	28	6	3	10	28	11.48
Russian Federation	890	1.1	75.30%	22	19	27	6	4	11	138	21.26
Scotland	604	0.7	63.40%	28	22	39	11	7	15	197	40.53
Slovakia	783	0.9	65.10%	31	25	36	8	4	12	76	11.73
South Africa	361	0.4	69.00%	32	23	40	8	4	12	85	31.95
Spain	541	0.7	64.00%	26	21	33	8	5	12	75	19.53
Sweden	307	0.4	77.20%	24	20	32	7	4	12	82	30.60
Switzerland	3317	4	65.00%	29	24	37	8	5	12	442	17.22
United States	5515	6.7	65.80%	24	20	33	7	3	11	2233	52.26

Note: Mdn: median and P25: 25th percentile and P75: 75th percentile. There was missing data for mental health, so these figures are based on *N*=64150 responses.

regret percentage was 20%, with 28.3% of respondents reported zero regret occasions. There was an inverse relationship between the frequency of getting drunk and the rate of experiencing regret when comparing countries. For example, respondents from Argentina and Colombia, who had the lowest frequency of getting drunk had a median regret percentage of 100%, while the median regret percentage was lowest in respondents from Denmark, which had the highest frequency of getting drunk.

Bivariate relationships

Table 3 shows a positive correlation between times drunk and regret occasions. However, as noted, there was an inverse correlation between times drunk and regret percentage; getting drunk more was associated with fewer regrets. Being younger was associated with more times drunk and, more regretted occasions, but a lower regret percentage. Those in higher AUDIT categories not only got reported getting drunk more frequently, but also reported regretted it more. Although men in the sample reported getting drunk more often, women had a significantly higher regret percentage. People with a mental health condition reported more times drunk, more regret occasions, and a higher regret percentage.

Regression analyses

Models in Table 4 show the predictors of times drunk, regretted occasions and regret percentage.

Times drunk

Being in the younger age categories or in higher AUDIT categories was associated getting drunk more often, while having a mental health condition was associated getting drunk less often, in contrast with the bivariate results, controlling for all other co-variates.

Regretted occasions

Higher frequency of getting drunk was associated with more regretted occasions. Being a woman or being in the younger age categories were both associated with more regretted occasions. Being in higher AUDIT categories or having a mental health condition were both associated with more regretted occasions.

Regret percentage

Getting drunk more often was associated with a lower regret percentage. Being in the younger age categories was associated with a lower regret percentage. Being in higher AUDIT categories was also associated with a lower regret percentage. Having a mental health condition was associated with a higher regret percentage.

Discussion

This paper aimed to explore country variations in experiences of getting drunk and regret in a large international sample. It

Table 2. Country comparisons of those reporting that they got never got drunk, drunk at least once in the last year, the number having no regrets, median regretted occasions of drunkenness and regretted occasions as a percentage of times drunk.

Country	Never drunk N Base N=82821	%	Included N Regrets N Base N=49885	No regrets N	%	Regret occasions Median (p25–p75)	Regret percentage Median
Total	12828	15.5	14094	14094	28.3	2 (0–5)	20 (0–50)
Argentina	533	48	315	18	5.7	3 (1–10)	100 (100–100)
Australia	366	5	4496	1259	28	3 (0–6)	16.67 (0–40)
Austria	364	9.7	2514	606	24.1	2 (1–5)	20 (3.33–50)
Belgium	63	14.3	299	84	28.1	2 (0–5)	20 (0–50)
Brazil	556	13.4	2290	746	32.6	2 (0–5)	20 (0–50)
Canada	122	10.1	821	263	32	2 (0–5)	16.67 (0–41.67)
Colombia	655	39.6	558	19	3.4	3 (1–7)	100 (100–100)
Denmark	229	5.1	3044	974	32	2 (0–7)	12.5 (0–50)
England	228	6.8	2257	487	21.6	3 (1–10)	20 (5–50)
Finland	147	6.8	1446	403	27.9	2 (0–6)	16.67 (0–41.67)
France	219	16.4	840	267	31.8	2 (0–5)	16.67 (0–42.26)
Germany	4654	17.3	16857	4999	29.7	2 (0–5)	20 (0–50)
Greece	210	17.8	549	167	30.4	1 (0–3)	20 (0–50)
Hungary	316	15.7	1241	368	29.7	2 (0–5)	20 (0–50)
Republic of Ireland	204	12.4	859	181	21.1	3(1–10)	30 (5.56–70)
Italy	64	14.4	254	89	35	1 (0–4)	20 (0–50)
Mexico	463	36.8	468	31	6.6	3 (1–10)	100 (50–100)
Netherlands	189	15.6	776	219	28.2	2 (0–5)	20 (0–50)
New Zealand	687	24.4	1401	466	33.3	2 (0–5)	16.67 (0–50)
Norway	68	16.2	271	91	33.6	2 (0–5)	19.23 (0–50)
Poland	27	10.5	179	32	17.9	2 (1–5)	25 (10–60)
Portugal	579	53.9	330	32	9.7	3 (1–10)	100 (50–100)
Romania	50	15.2	169	50	29.6	2 (0–5)	30.26 (0–50)
Russian Federation	91	10.2	483	143	29.6	2 (0–5)	25 (0–57.14)
Scotland	44	7.3	389	84	21.6	3 (1–10)	20 (5–50)
Slovakia	140	17.9	530	125	23.6	2 (1–6)	30 (3.75–66.67)
South Africa	81	22.4	192	53	27.6	2 (0–5)	30 (0–75)
Spain	182	33.6	222	36	16.2	3 (1–6)	56.67 (10–100)
Sweden	44	14.3	215	63	29.3	2 (0–5)	20 (0–50)
Switzerland	504	15.2	2150	582	27.1	2 (0–5)	20.83 (0–50)
United States	749	13.6	3489	1176	33.7	2 (0–5)	15 (0–42.86)

Note: N=49,885 for the N of times regret and regret percent. This number is the total N minus those who did not get drunk at all and a substantial number of people did not complete the subsequent regret question after inputting the number of times they got drunk. Colour coded columns are used to aid country comparisons for percentage of respondents never drunk and having no regrets. Green indicating higher proportions and red lower proportions.
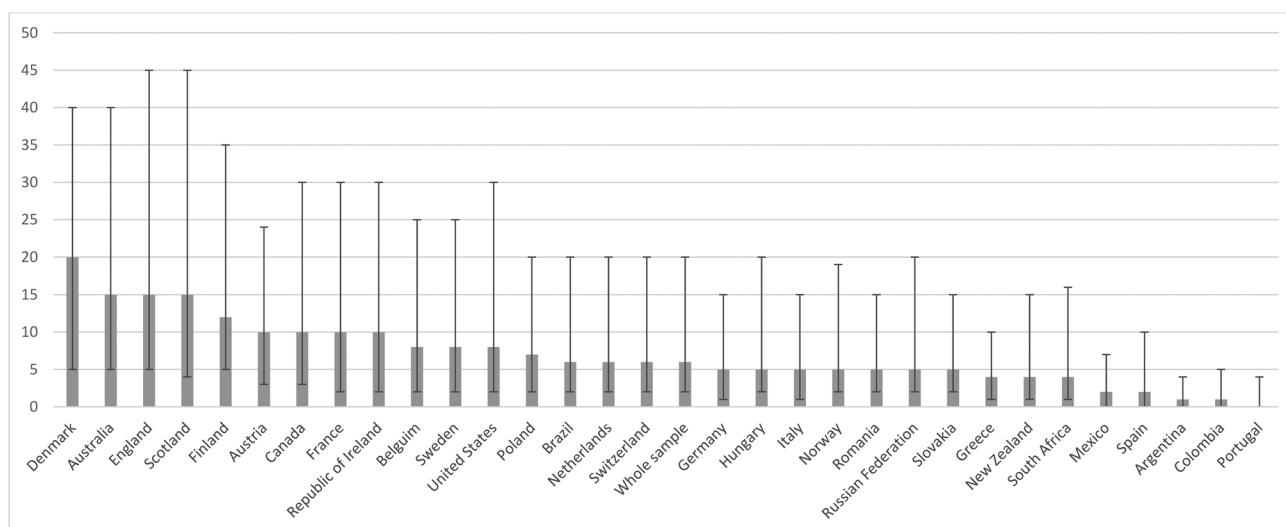

Figure 1. Country comparisons of median number of times respondents said they got drunk in the last year. Error bars represent p25 and p75.

also aimed to explore variables associated with frequency of getting drunk, regret occasions and regret percentage.

Country variation

Respondents from countries with a higher average AUDIT score reported more times drunk. The heaviest drinking respondents by AUDIT score were from Scotland and Denmark, findings which are largely in line with other GDS research (Davies et al., 2017; 2020) and patterns of drinking identified by the World Health Organization (WHO, 2018). This may reflect country differences in the acceptability of drunkenness, as well as the purpose and uses of alcohol in these locations. Country variations in frequency of getting

Table 3. Bivariate relationships between sociodemographic variables and times drunk, regretted occasions and regret percentage.

		Times drunk			Regretted occasions			Regret percentage	
		rs	p		rs	p	rs	p	
Times drunk		–	–		.565	p<.001	−0.030	p<.001	
Age		−0.305	p<.001		−0.078	p<.001	0.065	p<.001	
Age categories	N	Mdn (IQR)	Test statistic	N	Mdn (IQR)	Test statistic	N	Mdn (IQR)	Test statistic
16–24	37092	11 (3–30)[a]	H=8520.73	23569	2 (0–6)[a]	H=576.03	23562	20 (0–50)[a]	H=167.10
25–34	26248	6 (2–20)[b]	p<.001	16655	2 (0–5)[b]	p<.001	16652	25 (0–50)[b]	p<.001
35–54	16054	3 (0–10)[c]		8518	1 (0–4)[c]		8509	20 (0–66.67)[c]	
55+	3427	0 (0–0)[d]		1162	1 (0–3)[d]		1162	25 (0–100)[b,c]	
AUDIT score		0.655	p<.001		0.555	p<.001	0.24	p<.001	
		Times drunk			Times regret			% Regret Mdn	
		Mdn (IQR)	Test statistic		Mdn (IQR)	Test statistic		Mdn (IQR)	Test statistic
AUDIT Category	N		H=28725.34			H=13443.78			H=2393.32
Low	37758	2 (0–6)[a]	p<.001	19,108	1 (0–2)[a]	p<.001	19,091	10 (0–50)[a]	p<.001
Increasing	32,828	12 (5–30)[b]		22,238	3 (1–5)[b]		22,238	20 (5.45–50)[b]	
Higher	7216	30 (12–52)[c]		5,124	6 (3–15)[c]		5124	26.49 (10–60)[c]	
Possible dependence	5019	50 (24–100)[d]		3,434	18 (5–40)		3434	42.86(16.67–80)[d]	
		Times drunk		Times regret			% Regret		
Gender	N		H=851.27	N		H=131.70	N		H=771.49
Man	53,684	9 (2–25)[a]	p<.001	32,838	2 (0–5)[a]	p<.001	32828	16.67 (0–50)[a]	p<.001
Woman	28,171	5 (1–20)[b]		16,441	2 (1–5)[b]		16432	30 (4–66.67)[b]	
Non-binary	717	6 (2–20)[c]		468	2 (0–7)[c]		468	25 (0–60)[c]	
Different ID	249	6 (1–20)[a,b,c]		157	2 (0–6)[a,b,c]		157	20 (0–69.05)[a,b,c]	
MHX			U=435543488.5			U=17687589.5			U=173637745.5
No	46284	6 (2–20)	p<.001	29,067	2 (0–5)	p<.001	29,055	20 (0–50)	p<.001
Yes	17,866	7 (2–24)		11,231	2 (0–7)		11,229	25 (0–55.18)	

Note each superscript letter (a,b,c,d) indicates a group which differs significantly from any group not denoted with the same superscript letter, at the level p < 0.05.

drunk were in line with those from GDS2019, when a less robust definition of being drunk was employed (Davies et al., 2021). In the current study, we attempted to define getting drunk with further clarity so that translation of this term into languages other than English retained the same meaning. There was also variation in reported regrets between respondents from different countries. Interestingly, respondents from countries with lower average AUDIT scores regretted a higher proportion of the occasions they got drunk. These country differences are therefore likely to reflect the relative cultural acceptability/unacceptability of drunkenness (Davies et al., 2020; Measham & Brain, 2005).

Times drunk

Those countries reporting higher frequency of getting drunk associated with being younger and having higher AUDIT scores, while lower rates were associated with not reporting lifetime mental health conditions. These reflect other GDS findings relating to exceeding the tipping point (Davies et al., 2020). Previous research has found that higher risk drinkers tend to report enjoying the fun aspects of intoxication (de Visser et al., 2014), which may lead to more intentional drunkenness, and thus more alcohol-related harms.

Regret

Higher frequency of getting drunk was associated with more regret occasions. Having more regret occasions was associated with being younger, being a woman, having a mental health condition, and higher AUDIT scores. However, in line with other research findings, higher frequency of getting drunk

associated with a lower regret percentage—i.e. if those who got drunk more often had more regrets, but regretted a smaller proportion of the times they got drunk (Davies & Joshi, 2018). In another previous study, experiencing more regrets seemed to have no impact on future drinking intentions (Jones et al., 2020). People who get drunk less often may be less used to the short-term consequences and more likely to regret them.

There are many double standards when it comes to women's drinking (Atkinson et al., 2022; Brown & Gregg, 2012; de Visser & McDonnell, 2012), which may partly explain the greater prevalence of regrets in women in our sample. Typically, women have to contend with mixed messages about their alcohol consumption; for example, drinks may be marketed as products that underscore female empowerment (Atkinson et al., 2022), whilst women are often portrayed as responsible for sexual assault if they have been drinking (Livingston et al., 2013). Our findings contribute to the literature on gendered understanding of alcohol consumption, suggesting that mixed messaging may be internalized and manifest via regret.

Findings relating age may reflect an increased awareness of the health impacts of alcohol consumption in the older participants, leading to fewer times drunk, or greater concerns about self-presentation in the short term, leading to increased regrets. People in middle age, for example, tend to present themselves as experienced drinkers and able to successfully stay in control (Lyons et al., 2014). In some geographies, recent evidence suggests that older population groups appear to be consuming more alcohol than their younger counterparts (Daly & Robinson, 2021; Kraus et al., 2020; Miller et al., 2022). Understanding which experiences are more likely to lead to regret in different age groups would extend our findings and perhaps inform interventions for alcohol reduction in older age groups.

Table 4. Results of multi-level multivariable negative binomial regression models with country included as a random effect.

	Times drunk					Regretted occasions					Regret percentage				
	Effect	OR	Lower 95% CI	Upper 95% CI	p	Effect	OR	Lower 95% CI	Upper 95% CI	p	Effect	OR	Lower 95% CI	Upper 95% CI	p
Times drunk	–	–	–	–	–	F = 12146.18	1.02	1.02	1.02	<.001	F = 141.59	1.00	1.00	1.00	<.001
Gender	F = 106.09				<.001	F = 114.13				<.001	F = 63.87				<.001
Man		1.04	0.87	1.24	.625		1.00	0.81	1.23	.997		0.81	0.55	1.20	.288
Woman		0.86	0.72	1.03	.092		1.27	1.03	1.58	.028		1.14	0.77	1.69	.525
Non-binary		0.84	0.69	1.03	.100		1.11	0.87	1.41	.418		0.96	0.62	1.51	.871
Different ID (ref)															
Age	F = 1638.36				<.001	F = 59.65				<.001					<.001
16–24		3.97	3.77	4.18	<.001		1.30	1.20	1.41	<.001		0.67	0.58	0.76	<.001
25–34		2.74	2.60	2.88	<.001		1.22	1.12	1.32	<.001		0.77	0.67	0.87	<.001
35–54		1.80	1.71	1.90	<.001		1.04	0.95	1.23	.385		0.80	0.70	0.92	<.001
55+(ref)															
MHX	F = 5.94				.015	F = 20.04				<.001	F = 17.23				<.001
Yes		0.97	0.95	1.00	.015		1.07	1.04	1.10	<.001		1.17	1.06	1.18	<.001
No (ref)															
AUDIT	F = 9680.47				<.001	F = 2159.94				<.001	F = 164.04				<.001
Low risk		0.06	0.06	0.07	<.001		0.19	0.18	0.20	<.001		0.33	0.29	0.37	<.001
Increasing risk		0.23	0.22	0.24	<.001		0.44	0.42	0.46	<.001		0.46	0.41	0.51	<.001
Higher risk		0.47	0.45	0.49	<.001		0.73	0.70	0.78	<.001		0.60	0.53	0.68	<.001
Possible dependence (ref)															
RE var (SE)	0.183 (0.048)					0.084 (0.023)					0.125 (0.035)				
ICC	0.186					0.148					0.338				

Table presents odds ratios, confidence intervals and significance of the included variables associated with times drunk, regretted occasions and regret percentage.

Respondents with a lifetime mental health condition reported more regretted occasions and a higher regret percentage. While the range of mental health conditions was broad, anxiety and depression may play a role in alcohol related regret. For example, social anxiety has been associated with higher alcohol consumption (Davies & Paltoglou, 2019). People may consume more to feel comfortable in social settings, but then may experience greater levels of "hangxiety" the next day. Hangxiety is a colloquial term to describe inflated feelings of anxiousness the morning following a drinking occasion, and may be associated with alcohol use disorders (Marsh et al., 2019). Further research is needed to understand why respondents with a lifetime mental health condition may experience greater regrets from their alcohol consumption compared to those who did not report a lifetime mental health condition.

Limitations

Alongside the novel findings of this study, it is important to consider its limitations. As it was a cross-sectional opportunistic study, we make no claims about causality or representativeness. In common with other GDS studies, we recruited a greater proportion of respondents from Germany than from other countries. Although we improved on our previous study (Davies et al., 2021), the definitions and understanding of drunkenness and regret may differ for respondents from different countries. An important point is that people may also have more than one regret from a single occasion of drunkenness. For example, regret about a hangover, missing work or getting an injury. Our measure fails to capture this type of experience, and those who responded that they had more regrets than times drunk could have been responding in this way. We excluded people who reported more regrets than times drunk, but it is possible to hypothesis that people may have more than one regret per time drunk, and that our definitions were interpreted in various ways. The median age of the sample was 26, and so findings related to age are important to explore in sample with a greater number of older respondents. A further improvement to the study would be to include a measure of socioeconomic status to determine if regrets may differ due to this factor. We have included mental health and neurodevelopmental conditions together, and asked about lifetime diagnosis rather than current conditions. This relationship requires a further examination, which explores current symptom experiences, alcohol consumption and regret.

Implications

The findings of this study have implications for research and practice. It is important to disentangle the impact of specific mental health conditions on drinking regrets as well as looking at the impact of recent diagnosis and levels of current distress. Studies on regret often fail to specify the exact experiences that people may regret as a result of their

drinking (Cooke et al., 2007). For example, it may be that for some groups of people, posting on social media when drunk leads to regret (Geusens & Vranken, 2021), whereas other groups may interpret regretful experiences as more serious events such as accidents and injuries (Davies & Joshi, 2018). Our findings also indicate that a focus on regret could be harnessed for positive behavior change. If we can encourage people to reflect on regrettable occasions, they may be driven to reduce the amount of alcohol they consume in order to avoid feelings of regret. Existing research suggests that interventions that highlight the regrettable experiences that can result from drinking may be appealing to some people who consume alcohol (Davies et al., 2017). Further work is needed to understand which specific demographic groups would be best targeted by this approach.

Conclusions

In a large international sample, we identified country level and sociodemographic differences in frequency of getting drunk and regrets. While respondents who drank more alcohol reported more regrettable occasions, proportionally they had fewer regrets than respondents who drank less. Further research is needed to understand this effect, and harness the potential of using regrettable experiences as a means of encouraging people to consume less alcohol.

Declaration of interest

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