

The enigma of 'harmful' alcohol consumption; evidence from a mixed methods study involving female drinkers in Scotland.

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Abstract

Background/Aims: An appreciation of the drinking patterns of population subgroups may usefully inform tailored interventions. For this purpose research has highlighted a need to better describe the drinking behaviour of UK women. This study aims to characterise the purchasing and consumption behaviour of female heavy, harmed, drinkers in contact with Scottish health services in two cities and explore the factors that influence the link to harm.

Methods: Mixed method study involving cross sectional survey questionnaires and one-to-one interviews (5). The questionnaires documented (i) demographic data (including derived deprivation score), last week's (or 'typical' weekly) consumption (type, brand, volume, price, place of purchase), self-reported illnesses and (ii) Alcohol Related Problem Questionnaire score.

Results: Median consumption was 157.6 UK units for the recorded week, with almost exclusive purchase from 'off sale' retail outlets. Preferred drinks were white cider, vodka and white wine. Increasing problems was positively associated with drinking more in the week, being younger, and belonging to Glasgow.

Participants: 181 patients with serious health problems linked to alcohol, recruited within NHS hospital clinics (in- and out- patient settings), in two Scottish cities during 2012.

Conclusion: For Scottish women the current definition of 'harmful' consumption likely captures a fourfold variation in alcohol intake, with gender differences less apparent. While current alcohol-related harm is positively associated with dose and being younger, there is clear evidence of an influence of the less tangible 'Glasgow effect'. Future harm concerns are warranted by data relating to pattern, alcohol dose and cigarette use.

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Introduction

Alcohol-related harm to health and well-being is well documented in international literature. Considerable reactive research has been directed at the characterisation of the drinking behaviours of population subgroups to develop tailored interventions. One consideration is gender. Given a similar dose of alcohol, physiological differences explain the increased female vulnerability to alcohol's toxic effects compared with males. Gender variance is acknowledged in establishing national consumption guidelines including the UK¹.

Several recent reports emphasise aspects of concern relating specifically to the repercussions of women's alcohol consumption in the UK. In 2015 the report by the intergovernmental Organisation for Economic Co-operation and Development (OECD) singled out 'dangerous drinking among better-educated women' as a contributory factor to the rise in UK consumption since the 1980s and contrary to the trend recorded in other industrialised countries². In their review Smith and Foxcroft³ also highlighted the important changes which have occurred in female drinking within the UK in recent decades, accentuating issues pertaining to older women; a theme informing the work of Emslie et al.⁴. In relation to mortality, the female death rate attributable to alcohol in Scotland is lower than that of men at 14.4 per 100,000 population, but almost twice that of women in other UK regions (England and Wales, 7.7 per 100,000) (EASR, European Age-Standardised Rate)^{5,6}. Indeed female alcohol-related death rates in Scotland resemble those of English males, comparing unfavourably with those of European Union counterparts⁷. While recently within the UK there has been a modest fall in deaths overall, a rise in alcohol-related mortality in women born in the 1970s in deprived cities within the UK (including Glasgow) was reported by Shipton et al.⁸ who warned of the need for policy response.

UK female consumption is defined as 'hazardous' (exceeding weekly limits of 14 UK units) or 'harmful' (>35 units per week) where one UK alcohol unit equals 8g of ethanol⁵. Scottish Health Survey (SHeS) data suggests almost one in six Scottish women drink at harmful or hazardous levels⁹. However the UK prevalence of female 'harmful' drinking is likely underestimated for several reasons; drinkers may be omitted from population surveys because their lifestyle precludes their participation or they may self-exclude. Furthermore, within national surveys, under-reporting is commonplace¹⁰. Beeston et al.¹¹ estimated self-reported Scottish adult consumption in 2012 equated to only 54% of that predicted by retail sales data. Our previous work demonstrated that the defined threshold for 'harmful consumption' is considerably below that at which women receive treatment; amongst Scottish women attending services or admitted to hospital for alcohol-related harm, median consumption (most recent or typical week) was 143.1UK units (IQR=121.29)¹² (approximately four times the accepted definition).

Another important factor which influences the relationship between female alcohol consumption and harm is deprivation. In 2013/14 alcohol-related hospital stays for women were 5.8 times greater in the most deprived decile than in the least¹³ (EASR, excludes obstetric and psychiatric). In 2011 alcohol-related mortality rates (both genders) in the most deprived decile were 7.7 times those of the least deprived⁵. The precise detail of the interplay between alcohol intake, harm and deprivation is still debated^{14,15}. For example, the health gap, illustrated by the excess adult mortality now linked to alcohol, drugs, suicide and violence in Scotland when compared to England and Wales, is not explained simply by deprivation and has been referred to as the 'Scottish' or 'Glasgow' effect¹⁶.

An interest in the price paid per drink, and associated harms, seems to have been a relatively recent topic in the public health discussion of alcohol-related disease and social damage. In General population surveys data from New Zealand revealed that drinkers paying lower prices

for their take-away alcohol were 2.2 times more likely to drink large amounts per session and be a daily drinker¹⁷. In Scotland drinkers made ill due to drinking alcohol were found to purchase much more of their alcohol as cheap beverages than the wider drinking population¹². However, to our knowledge, specific examination on female heavy drinkers and their purchasing habits has not been described. The Sheffield studies (e.g. ¹⁸), and others¹⁹, which predict for the UK that legislating for a minimum price per unit of alcohol would reduce heavy drinking and harms, necessitate many assumptions because they were not built on a dataset that included individual drinkers' alcohol consumption and purchase price. The Sheffield model¹⁸ linked data from a General Lifestyle Survey containing information on mean weekly and highest daily alcohol consumption by beverage types, and the UK Living Costs and Food Survey containing information on alcoholic beverages purchased off-trade and on-trade and prices paid. Sheron et al²⁰ did investigate consumption levels and price paid amongst liver patients recruited within hospital in and outpatient settings in the UK but did not detect a gender difference in alcohol consumption and consequently did not explore female-specific aspects of drink choices etc. Our findings reported here, contribute to the public health debate, for they focus specifically on the alcohol consumption and purchasing of female heavy drinkers.

We provide a detailed description of the drinking behaviour of women whose harmful consumption pattern has necessitated attendance at National Health Service (NHS) settings (in- or out-patient). Crucially we enhance the alcohol consumption data with comments relating to drinking practices and specific drinks gained from one-to-one interviews. Participants were recruited in Scotland's two largest cities; Glasgow and Edinburgh, both located within central Scotland, a region which accounts for 70% of Scotland's population²¹. Alcohol-related mortality is 14% higher in this region than the Scottish average²². Also, these cities encompass sharply contrasting deprivation profiles. Of the 325 Scottish datazones within the 5% most deprived category, Glasgow city contains 45.5% whereas Edinburgh contains 5.8%²³.

The aims of this mixed-method study were to;

1. describe consumption levels, drink choices, price paid and place of purchase for a sample of the heaviest female consumers of alcohol in medical contact.
2. explore predictors of harm linked to alcohol consumption (operationalised by the Alcohol Related Problems Questionnaire score).
3. record through semi-structured interviews issues reported by drinkers to impact on alcohol availability, consumption and perceived harm.

Methods

Sample;

During 2012, female heavy drinkers (n=181) participating in a wider study involving both genders (n= 639²⁴) were recruited from NHS alcohol services outpatient and day patient clinics and from amongst patients admitted to hospital with a diagnosis of a physical or psychiatric alcohol-related illness. Exclusion criteria were - being under 18 years old, unable to understand the questions or give understandable answers in English, evidence of clinically significant memory impairment e.g. Korsakov's Dementia, being unwilling to be contacted for three further follow-up interviews (this relates to a follow-up study not reported here). In addition, advice from clinicians at each site was taken where patients were unsuitable for inclusion due to separate clinical issues. Of those meeting the inclusion criteria (n= 262), 69% of women agreed to participate.

Measures

Participants responded to a questionnaire which, in addition to demographic data, documented 'typical' or 'last' week's alcohol consumption (type, brand, volume, price, place of purchase). Smoking status, self-reported health issues and Alcohol Related Problem Questionnaire (ARPQ) score were recorded. The ARPQ is an eleven point questionnaire used to assess severity of alcohol related problems²⁵. Scores range from zero to eleven with the highest indicating greatest problems and relate to four domains (physical health, mental health, social problems, and judicial problems). It does not diagnose drinker type as harmful or dependent (e.g. as in AUDIT) or quantify consumption, rather it permits derivation of a score related to current harm. During the interview, participants were also asked to self-report any current physical or mental health condition associated with their drinking. This was usually partly or wholly connected to presentation at health care services. (Due to ethical constraints, it was not possible to verify self-reported illness with clinical notes.)

We recorded participant's postcode to determine a proxy measure of socioeconomic status using the Scottish Index of Multiple Deprivation (SIMD) the Scottish Government's tool for identifying areas of deprivation²³. Scotland is divided into 6505 datazones, ranked from most, to least deprived. The datazones can be ordered into quintiles and deciles; quintile 1 containing the 20%, decile 1 the 10%, of the most deprived datazones etc.

Five women (Edinburgh (3) Glasgow (2)) were recruited for an extra semi-structured interview exploring issues around purchasing experiences. Participants were purposively selected on the basis that they had been drinking heavily at third interview, and where possible, that the average price paid, was less than 50 (0.7Euro) ppu (pence per unit) of alcohol, as we wished to interview those who would be most affected by a reduction in income and/or potential price increases. Care was taken to ensure that they were approximately representative of the total sample by gender, social deprivation quintile and age. (Women comprised approximately 25%

of both Glasgow and Edinburgh samples). Interviews (conducted between October 2013 and March 2014) were recorded using an encrypted digital recorder, taking 20-50 minutes.

Data analysis

Data were analysed using SPSS v19. Group differences were investigated using the independent t-test and ANOVA, parametric tests, and where required, the Mann Whitney-U test, non-parametric test. Chi-square tests of association were employed for categorical variables. An alpha value of 0.05, two-sided, was considered significant with 'r' being reported as a measure of effect size. The Jonckheere-Terpstra test (one-sided) was employed to investigate for trend across medians of independent groups. Univariable and multivariable linear regression analyses were employed²⁶ to investigate associations of various factors (see tables 2 and 3) with ARPQ score. The final model presents the coefficient and the 95% confidence interval for remaining significant factors.

Qualitative Interview data

Interviews were transcribed verbatim and analysed using thematic analysis²⁷. Transcripts were read several times, to identify categories of relevance to the research aim; emerging themes and commonalities were noted. Categories were grouped according to consistency in topic, and in relation to the research aim. Themes were thereby constructed representing topics that recurred throughout the dataset in order to determine the understandings of the participants. A second researcher confirmed verification of coding. Authors conducted iterative discussions regarding theme construction and interpretation.

Ethical considerations

Favourable ethical opinion was given by NHS Lothian Research Ethics committee (08/S1101/9) with additional approval from the Caldicott Guardians.

Results

General Characteristics

Questionnaires were completed with 181 women (gender ratio original sample; 2.5:1). Greatest representation was in the most deprived quintile, SIMD quintile (1) (40.3%). Percentages for female participants in quintiles 2 through 5 were 22.1%, 15.5%, 10.5% and 11.6%.

For consumption characteristics see Table 1 and Figure 1. Median consumption in the recorded week was 157.6 UK units (IQR=159.8). Deprivation quintile 1 recorded the highest median consumption but was only significantly higher than quintile 4 ($p = 0.031$). Almost one third of women ($n=66$) reported consumption >200 units, (median consumption=262.5 UK units (IQR=96.33)).

Table 1 about here

Figure 1 about here

Data collected from males, recruited identically, permitted gender comparisons. Overall females drank significantly fewer units than males ($n=458$) (median male consumption = 196.0 (IQR=167.5), Mann-Whitney $U=31921.00$, $p<0.001$). However this gender difference was only evident in quintiles 1 ($p=0.006$), 2 ($p=0.015$) and 4 ($p=0.032$) and not in quintiles 3 and 5, where no significant gender difference was noted.

The most deprived group reported the highest ARPQ score, being significantly higher than that of quintiles 3, 4 and 5 but not 2.

Analysis of trends across the quintiles suggests that decreasing deprivation (i.e. across quintiles 1, most deprived, through to 5, least deprived) was associated with decreased prevalence of smokers, decreasing median alcohol unit consumption, decreased ARPQ score but increasing alcohol unit price (table 1).

Five participants provided qualitative interviews (most recent week's consumption 91.88 to 196.88 units; mean unit price 31-60 pence, aged 39-60 years). Three were in SIMD quintile one, one quintile 2, one quintile 4.

Drink Prices and Choices

Qualitative interviews revealed cognisance of price (allegiance to cheap types or switching to cheaper brands), *'If you know you need to drink you will buy what's cheaper so that you can get more. It just comes down to cost'*(G1, Glasgow participant 1). Seeking out special offers rather than favouring the nearest outlet was described *'Family look online for best deals at large supermarkets and buy accordingly.'* (G2) Being organised was another way of obtaining the cheapest prices. Asked whether she would shop around or travel to find an offer, one participant said, *'Not really, no. When you're in a situation where you really sort of need a drink, you just go to your local...I mean, I've got a local supermarket anyway, that tend to do the deals, so I'll go there, and whatever is on offer, that's what I'll go for'*. (G1).

Three drinks were particularly popular both in terms of number of drinkers and total units consumed: vodka (40.6% of all units) white cider (18.3%) and white wine (15.4%), accounting for 74.4% of all units consumed in the recorded week. Respective median (IQR) unit prices

were 41.0 ppu (9.0), 17.0 (3.0) and 50.0 (17.0). Unit price paid varied little across deprivation quintiles. Only white cider (lowest unit price) was not consistently popular (zero consumption by quintile 5). Some drank one beverage exclusively: vodka (n=42) white cider (n=12) white/rose wine (n=28).

Two beverages appeared to fulfil specific roles. The high ABV% (alcohol by volume) of vodka was attractive, additionally one woman who concealed her drinking advised that '*vodka doesn't smell and it's easy to drink quickly so it's the easiest thing to drink in secret*'. (E1). For white cider the draw was undoubtedly low price, being reliably cheap: '*but the cider [white], it's always the same price for the cider*' (E3). '*I have moved from white wine to cheap cider. I had to go for the cheapest option due to lack of money ... it is all just down to finances*' (G1). White cider did have a poor reputation '*it's absolutely horrendous on the body*', and '*... it's all just chemical stuff, isn't it? It's I mean, I know beer is not exactly organic but, [laughs], do you know what I mean?*' (E2). Participant G1 drank white cider, but expressed a strong dislike for it. '*I can't abide [white] cider, but when you're desperate for a drink, and you can get it so cheap, yeah, I've gone for that ... it's only when I'm down to my last pennies*' (G1).

Location of Purchase

Off-sale settings (shops, supermarkets and off-licence outlets as opposed to on-sales in public houses and restaurants) dominated purchasing; 98.9% of units for women (for men 93.41%).

One participant reported several options for local purchasing '*the first wee shop is about a 2 minute walk, the next one is about 2.5 minute walk, the next one is about 3 or 4 minute walk, the next one is about 5 minute walk. You know what I mean?*' (E1). Another commented '*Far too many. In my little area [counting on her fingers] 7 places ... that doesn't include pubs*' (E2), while another stated that distance to any outlet was irrelevant when the need to drink was

overwhelming '... if you are really desperate for a drink you would walk 5 miles to the nearest place to actually get that, if you were really desperate, you would'. (G2)

Despite potential for social contact, the cost of on-sales drinking was viewed as prohibitive 'I did, yeah, when I could afford it [laughs]. I did, yeah, pre-children. But that was social drinking, that was responsible drinking' (E2) and 'a lot of people can't even afford to go out now, I mean, people that are working and have got money' (E1).

Another participant described going out to play Bingo

'I would maybe go in to the [supermarket] next door and buy a half bottle, and a couple of wee bottles of flavoured water, and go into the toilet and sort of fill them up, and that way I could save money instead of going to the bar in the bingo'... (G2)

Smoking and other substance use

Just under 70% of women smoked, the highest percentage from quintile 1 (82%, n= 60) (table 1). Smokers spent significantly more on alcohol in the recorded week; £71.39 compared to non-smokers, £44.73 (Mann-Whitney U=2398.50, p=0.001).

Some women (n=35) reported use of substances apart from alcohol (controlled drugs, controlled medications (not prescribed) or over-the-counter medication used to enhance the effects of alcohol). Cannabis was the most popular, taken on at least one day in the recorded week by 11% of all women. No illicit alcohol consumption was reported (i.e. alcohol for which no tax was paid or had been produced illegally).

Harm linked to consumption

One participant volunteered the following *'I used to drink vodka, then I went down to wine, and then I went down to beer. ... vodka, you know, has been horrendous on the body, so it wasn't because of the price.'* (E2), and in relation to ciders

'I don't touch them, I won't touch them. No. ...the effects that it has on your body. I mean, I know you can get ... bottles for a fiver, whatever it is, but it's just that it's absolutely horrendous on the body.' (E2)

Illicit alcohol was viewed as particularly harmful *'Aye, contraband and that. I would never dream of going near that, even though it's dirt cheap, you know what I mean. I'm too worried about my health [laughs].'* (E1), while another revealed.

'I know it sounds funny but, em, I'm scared of what I put in my body. I know if it's on sale in a supermarket, then it's relatively safe. I wouldn't know what I'd be buying, and I wouldn't know what was in it, and that would scare me.' (G1).

At recruitment 63.5% (n=115) of women self-reported a mental health issue (self-harm, suicide attempt, depression, anxiety or stress). Self-harming was reported by 14.4% (n=26) of women. Between 2012 and 2015, 25 women died (13.8% of participants). The mean age at death was 49.1 (10.8) years.

Relationship between consumption and harm

Several factors were found to be univariably associated with ARPQ score, namely; age, cigarettes smoked per day, unit price, total units consumed in the index week, white cider percentage consumed, expenditure, time, any drug use, city and SIMD two categories (most deprived versus other SIMD quintiles) (see table 2). A multivariable regression model was developed with those univariably significant factors. This indicated a significant independent negative association with ARPQ for age (-0.067, 95%CI:-0.095, -0.038) and a positive

association for consumption in the index week (0.006, 95%CI: 0.003, 0.008) and residing in Glasgow compared to Edinburgh (1.328, 95%CI 0.719, 1.937) (see table 3). The model accounts for around 32% of the variation in ARPQ score.

Table 2 about here

Table 3 about here

Discussion

Our female 'harmful' consumers report a wide range of alcohol intake. Median consumption (158 UK units in the recorded week) is approximately 4.5 times the UK threshold defining 'harmful' alcohol consumption (>35 units per week)⁵ and is consistent with that reported by Black et al.¹² Over one third, (n=66) of women reported consumption exceeding the equivalent of 5 litres of spirits in their week of drinking (>200 UK units). Intuitively it seems unlikely that harm experienced at each extreme of this consumption range is similar. Population survey estimates can be criticised for not adequately exploring the impact of drinking pattern on associated harm¹⁰. Ironically, for the heaviest of our drinkers, daily pattern may be less relevant, especially where consumption is not interspersed with other nutrient or fluid intake. Sensitive gastrointestinal tissue may face a relatively constant exposure to alcohol or its damaging metabolites.

The expected gender divide in consumption which characterises population consumption surveys, was not evident in quintiles 3 and 5 (the least deprived). Shipton et al.⁸ report a disproportionate increase in alcohol-related mortality among the youngest cohort of women they studied (born 1970s). Here, 43% (n=42) of Edinburgh women and 41% (n=34) from Glasgow

were born in that decade or more recently, and of 25 reported female deaths amongst participants, ten were ≤ 45 years at time of death.

Participant's preferences for off-sale purchases (98% of units consumed) and vodka (41% of units consumed) are consistent with, but more pronounced than, Scottish general population data. Around 69% of alcohol sold in Scotland is through the off trade with 13% of this sale linked to vodka¹⁵. (Scottish off-trade sales of vodka are 2.2 times higher than in England & Wales¹⁵). While price clearly influenced purchasing behaviour, participant's accounts attest to the easy availability of alcohol. Analysis of trends across the quintiles suggested that decreasing deprivation was associated with decreasing median alcohol unit consumption, but increasing alcohol unit price. This may explain why there was no significant trend for expenditure in the index week across quintiles.

Participant's narratives linked potential health-harm with particular drinks e.g. vodka and white cider. This was also true of illicit alcohol. Curiously wine drinking was as common as the cheapest drink (white cider) but was approximately three times as expensive. A key Scottish Government alcohol policy is to set a minimum unit price for alcohol²⁸ (not currently enforced due to legal challenges²⁹). If imposed at the anticipated level (50 pence (£0.5) per UK unit), consumption by those exclusively drinking white wine would be relatively unaffected; i.e. 15.5% of all women (and of those, 12% were in the most deprived socioeconomic grouping).

White cider was the cheapest drink purchased, approximately one third of the proposed minimum unit price for alcohol. Participant's accounts attest to its role as a vital source of

alcohol when funds are low despite beliefs of associated harm. Interestingly it was not purchased by any women in the least deprived quintile.

Consideration of a 'future' harm effect is also warranted. A dose-related link of alcohol to breast cancer risk³⁰ is documented. The prevalence of smokers is relevant. In the two quintiles with highest alcohol consumption, the percentage of smokers exceeded 70%. (In the Scottish general adult population smoking prevalence is around 23%.³¹) Tobacco interacts with alcohol to increase aerodigestive cancer risk³². Additionally, it can be argued that economic deprivation and addiction may combine to support the priority purchasing of cheap alcohol over food, exacerbating carcinogenic risk.

Scotland (particularly Glasgow) is linked to excess poor health compared to the rest of the UK and western Europe³³. Excess mortality has been associated with alcohol, drugs and suicide³⁴ being described as the 'Glasgow Effect'. Glasgow is characterised by a rate of alcohol-related deaths approximately twice that of Edinburgh³⁵. Within Glasgow a four-fold variation in alcohol-related deaths is evident when comparing most and least deprived quintiles³⁵. Our data are consistent with this 'Glasgow effect'. Findings demonstrated that increasing alcohol-related harm (ARPQ score) is associated with, being younger, higher consumption of alcohol but the aggravating effect of city is also clear. Location is pivotal in influencing the negative impact of alcohol.

Our study has several limitations. Consumption data, health conditions and ARPQ data are self-reported, although one strength of our study is that interviews took as long as required and researchers guided participants through recall of consumption, exploring ambiguities. We cannot generalise to all heavy drinkers. It is estimated that in 2012 one in four Scottish adults with possible alcohol dependence accessed alcohol services¹¹. In our study 83 women refused

to participate, 69% of those approached provided data. The SIMD can be criticised in relation to poor sensitivity, it permits linkage of an individual's postcode to a nationally derived deprivation rank based on seven domains indicating multiple deprivation²³. In effect we have used an area based measure to assign deprivation score to an individual. Our participant's scores are therefore based on a collective, ranked score for an area comprising on average 800 residents. We acknowledge that the ARPQ was developed to produce scores as a proxy for resource use and quality of life in alcoholism treatment. This single score is used here to quantify harm.

In this group of heavy drinking women identified within clinics and hospital settings, the harmful repercussions of consumption which necessitated their presentation to services are likely compounded by a range of factors e.g. smoking and environment. Their consumption is supported by readily available alcohol with the cheapest drink performing a key, buffering role, in times of economic hardship. Their reported consumption provides further evidence of the erosion of the gender divide. We would argue for interventions which specifically address the needs of female dependent drinkers. The introduction of a 50 pence minimum unit price for alcohol will not impact on all purchasing.

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Figure 1 Frequencies of different consumption levels in recorded week (UK units) split by SIMD quintile. (1 being most deprived.)

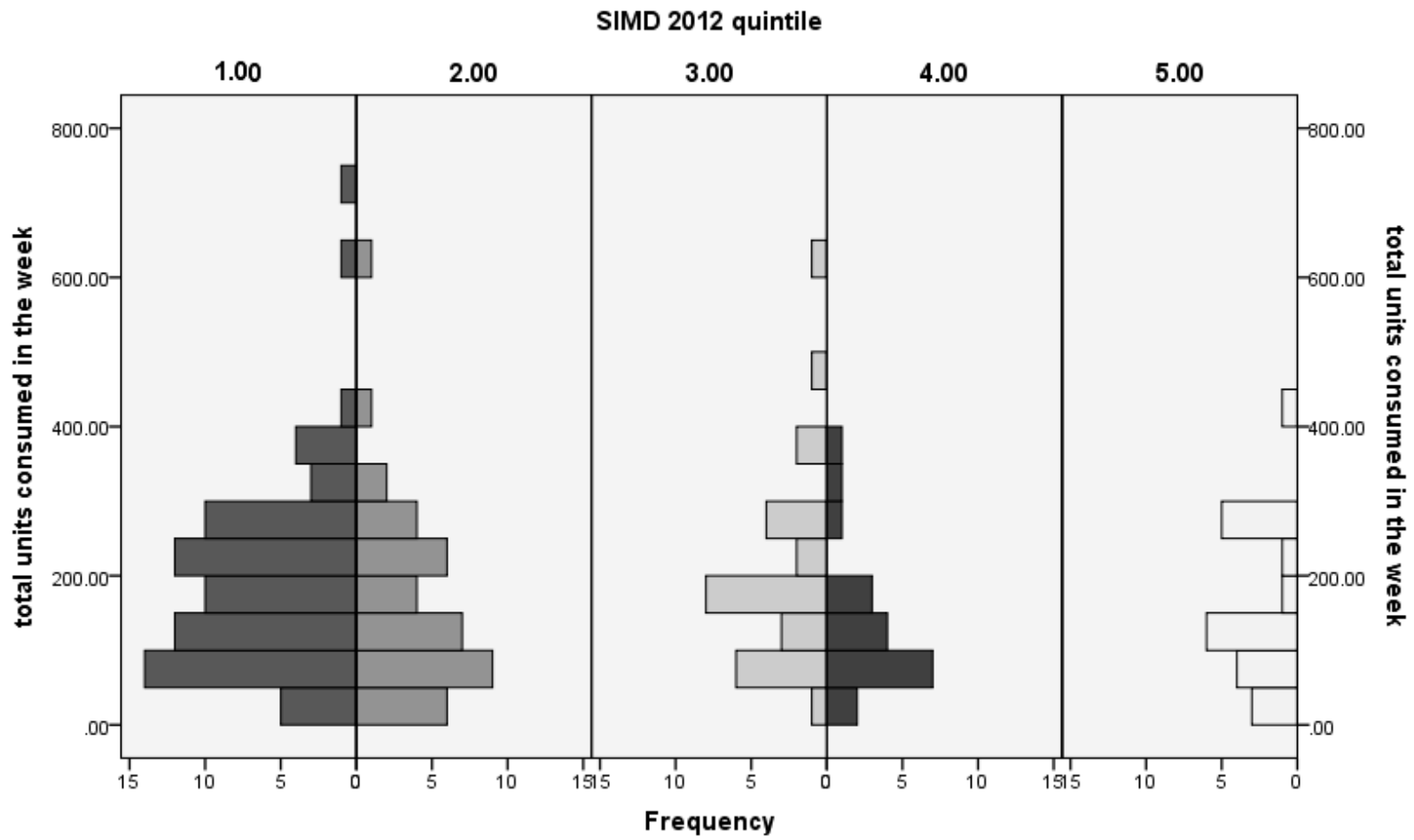


Table 1: Descriptors of female drinkers by deprivation quintile

	All (n=181)	SIMD 1 (n= 73)	SIMD 2 (n= 40)	SIMD 3 (n=28)	SIMD 4 (n=19)	SIMD 5 (n=21)	Quintile Comparison (p value)	Test for trend
Mean age in years (95%CI)	44.5 (42.9- 46.1)	43.3 (40.8- 45.9)	44.2 (40.6- 47.8)	43.8 (39.4- 48.1)	46.3 (42.2- 50.3)	48.9 (43.3- 54.4)	n.s.	n.s.
% (n) smokers	68.5 (124)	82.2 (60)	65.0 (26)	71.4 (20)	57.9 (11)	33.3 (7)	0.001 (chi squ)	Linear-by-linear association. p<0.001
Median (IQR) consumption in recorded week (UK units)	157.6 (159.8)	183.8 (157.8)	119.0 (158.8)	165.0 (159.9)	105.0 (105.8)	136.5 (193.1)	Q1 vs.Q2, n.s. Q1 vs. Q3, n.s. Q1 vs. Q4, U*=469.50, z=- 2.161, p=0.031, r=- 0.225 Q1 vs. Q5 n.s.	Standard J-T statistic = -1.675 p= 0.044 (one sided)
Median (IQR) price paid per UK unit (pence)	40.0 (17.0)	39.0 (19.0)	38.0 (13.0)	40.0 (15.0)	44.0 (17.0)	43.0 (16.0)	Q1 vs. Q5 U=539.5, z=- 2.152, p=0.031, r=- 0.222	Standard J-T statistic = 1.968 p= 0.025 (one sided)
Median (IQR) expenditure (£) for the drinking week	62.50 (54.09)	65.86 (54.35)	51.77 (56.09)	74.72 (58.31)	47.20 (35.20)	65.53 (61.29)	n.s.	n.s.
Median (IQR) ARPQ score**	7.0 (4.0)	8.0 (3.0)	7.0 (4.0)	7.0 (3.0)	6.0 (2.0)	6.0 (5.0)	Q1 vs. Q2 n.s. Q1 vs.Q3, U=727.00, z=- 2.095, p=0.036, r=- 0.211 Q1 vs.Q4, U=392.00, z=- 2.817,	Standard J-T statistic = -3.788 p< 0.001 (one sided)

							<p>p=0.005, r=-0.297 Q1 vs.Q5, U=413.50, z=-2.864, p=0.004, r=-0.300</p>	
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Table 2: Factors associated with harm (ARPQ score) - univariate regression

Factors	Mean(SD)	Median (IQR)	Minimum, Maximum	B(95%CI)
Age of patient in years	44.5 (11.00)	46.0 (14.0)	18, 74	-0.091*** (-0.122,-0.061)
Number of cigarettes smoked per day	13.1 (13.46)	10.0 (20.0)	3.0, 80.0	0.042** (0.015,0.068)
Mean unit price for the week £	0.42 (0.17)	0.40 (0.17)	0.11, 1.25	-2.244* (-4.39,-0.099)
Total units consumed in the week - all drinks	179.2 (121.74)	157.6 (159.8)	9.75, 721.9	0.008*** (0.006,0.011)
Cider % of total consumption (excludes white cider & perry)	8.20 (24.70)	0.0 (0.0)	0.0, 100.0	0.003 (-0.012,0.018)
Beer % of total consumption	7.26 (23.30)	0.0 (0.0)	0.0, 100	-0.003 (-0.019,0.013)
Spirits % of total consumption	42.06 (45.20)	16.27 (100.0)	0.0, 100.0	0.000 (-0.008,0.008)
White cider % of total consumption	13.2 (30.76)	0 (0)	0.0, 100.0	0.012* (0.001,0.024)
Vodka % of total consumption	37.4 (44.25)	3.3 (97.229)	0.0, 100.0	0.008 (0,0.016)
White/rosé wine % of total consumption	19.93 (37.67)	0 (11.77)	0.0, 100.0	-0.007 (-0.017,0.002)
Total expenditure for the week £	68.1 (42.31)	62.50 (54.09)	2.03, 252.0	0.021*** (0.012,0.029)
Total time in hours spent drinking in the week	68.3 (44.90)	64 (62.75)	0.25, 168.0	0.016*** (0.008,0.024)

	% (N)			
SIMD two categories				1.33*** (0.61,2.05)
Quintiles 2,3,4,5	59.7(108)			
Quintile 1 (Lowest)	40.3(73)			
City				1.608*** (0.916,2.301)
Edinburgh	54.1(98)			
Glasgow	45.9(83)			
Self-reported medical and psychiatric condition				0.653 (-0.225,1.532)
Medical	22.7(41)			
Psychiatric	77.3(140)			
Self-reported liver disease				0.37 (-0.365,1.105)
No problem reported	56.4(102)			

Problem reported	43.6(79)	
Any drug use reported		-1.29** (-2.19,-0.39)
YES	19.3 (35)	
NO	80.7(146)	

* P<0.05

**P<0.01

***P<0.001

Table 3: Factors associated with harm (ARPQ score) - multiple regression.

Factor	B (95% CI)
Age of patient in years	-0.067*** (-0.095, -0.038)
Total units consumed in the week - all drinks	0.006*** (0.003, 0.008)
Living in Glasgow	1.328*** (0.719, 1.937)
N	178
Adjusted R square	0.32

* P<0.05

**P<0.01

***P<0.001