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Factors associated with very high-risk drinking in the Australian general population: How do men and women compare?

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Abstract

Introduction: Despite vulnerability to alcohol-related harms, women have historically been under-represented in alcohol research. This study examined the prevalence and characteristics of women who drink at very high-risk levels (11+ standard drinks monthly), factors associated with this consumption and comparisons with men.

Methods: Secondary analyses of 2019 National Drug Strategy Household Survey data were undertaken. Significant differences by sex in the distribution of demographic and alcohol-related variables were explored using chi-squared and Mann–Whitney U tests. Binary logistic regression examined factors associated with very high-risk drinking.

Results: Very high-risk drinking was reported by 10.4% of men and 3.1% of women. Compared to men, women were significantly younger with higher levels of psychological distress/mental health conditions, and were more likely to be unmarried. Both women and men engaged in a range of harm-minimisation strategies. Odds of very high-risk drinking were significantly higher for respondents who were male, younger, employed, lived in a regional/rural/remote area, psychologically distressed, smoked and used illicit drugs. Interactions with sex indicated that very high-risk drinking declined after the age of 24 for men compared to 44 for women. Being married reduced the likelihood of very high-risk drinking more greatly among women compared to men, while living in a major city reduced the likelihood among men (and not women).

Discussion and Conclusions: Very high-risk drinking is not limited to Australian men, and the women who drink at these levels have distinct profiles and factors associated with consumption.

KEYWORDS
alcohol, risky drinking, sex, women

1 | INTRODUCTION

Alcohol is a key contributor to the global burden of disease. More than 200 types of injuries and diseases have been associated with alcohol consumption [1], and alcohol is responsible for 7.2% of all premature mortality globally and 4.5% of the total burden of disease in Australia [1, 2]. In 2019, a quarter of Australians drank at levels that put them at risk of harm at least once a month [3]. In addition, approximately 10% of current Australian drinkers were likely to meet the criteria for alcohol dependence [3] and there were over 75,000 treatment episodes for alcohol use throughout the country [4]. Alcohol-related healthcare expenditure in Australia has been estimated to cost up to $2.57 billion annually, with non-healthcare costs attributable to alcohol exceeding $7 billion [5].

Both in Australia and internationally, fewer women than men consume alcohol, and when they do drink women drink less and exhibit patterns of heavy drinking less often [1]. However, research indicates that women are more likely than men to experience negative consequences from a given level of alcohol consumption. Neurochemical, hormonal, genetic and environmental factors result in significant differences in the ways in which women's bodies absorb, distribute and metabolise alcohol [6]. Consequently, women typically become impaired from alcohol at an earlier stage of drinking than men, and are more likely to experience alcohol-related harms, such as cognitive- and motor-impairment, accidents, suicide, cancer, liver disease and heart disease, among others [6].

Women's alcohol consumption behaviours have also undergone substantial changes in recent decades. In 2019, 17% of Australian women drank at levels that placed them at risk of alcohol-related disease or injury at least once a month, compared to 35% of men [3]. This represents a substantial increase in women's consumption, and a continuing convergence in the consumption patterns of women and men over time in multiple countries [7–9]. For example, daily alcohol consumption among Australian women increased by 203% between 1950 and 1980, compared to just 6% among men [10]. Furthermore, there are indications that the COVID-19 pandemic has resulted in increased consumption, particularly among women [11, 12]. Correspondingly, women are experiencing substantial alcohol-related harm. In 2018–2019, women accounted for 26,951 treatment episodes [13] and 31,477 hospital separations for alcohol use in Australia [14]. More than 350 Australian women died from alcohol-caused diseases in 2019 [15].

Despite this, women in the general population have historically been under-represented in alcohol-related research [6]. In particular, research regarding women who drink at very high levels is lacking, with the majority of research not differentiating between those who drink slightly above the official guidelines (i.e., 4 standard drinks per day/10 per week [16]) and those who drink well above these levels. This is an important oversight. Compared to men, women who drink very heavily are less likely to be identified in healthcare settings or referred to treatment by their employer [17], and experience a range of barriers to accessing treatment (e.g., high levels of stigma, concerns that children will be removed from their care, risk of experiencing family violence, financial and logistical difficulties) [18, 19]. As a result, women may be less likely to engage with treatment programs or services than men [19–22]. Consequently, samples drawn from clinical settings may represent a particularly motivated and/or high-risk population of women while excluding those who are not engaged with treatment services, but nonetheless at significant risk of alcohol-related harm.

Research examining the characteristics of women drinking at very high levels in the general population is therefore imperative. A better understanding of the demographic and health characteristics of this population of drinkers, as well as their alcohol-related behaviours, could assist healthcare practitioners to more readily identify women at risk of harm. Given the substantial health consequences for women drinking at very high levels [6], including the increased risk of developing future alcohol use disorders [23], proactive screening, identification and intervention is a priority for preventing the escalation of individual and social harms. The current study therefore sought to examine the characteristics and alcohol consumption behaviours of women who drink at very high levels. Specifically, it aimed to elucidate: (i) the number and sociodemographic characteristics of women who drink at very high-risk levels; (ii) their alcohol-related behaviours; and (iii) the factors that predict heavy consumption. It further aimed to examine the extent to which these areas differ between women and men.

2 | METHODS

2.1 | Data source

Secondary analyses were conducted on data from the 2019 National Drug Strategy Household Survey (NDSHS) [24]. The NDSHS is Australia's largest data source on adults' self-reported attitudes, opinions and behaviours regarding alcohol, tobacco and other drugs. The sample was selected using stratified, multistage random sampling and weighting applied to ensure representativeness of the Australian

population; full sampling and weighting details are available elsewhere [25]. In 2019, the NDSHS achieved a response rate of 49.0% (total $N = 22{,}274$) [26]. All analyses in the current study were limited to respondents aged 18 years and older ($n = 8272$ males and 10,406 females).

2.2 | Measures

2.2.1 | Health and demographic characteristics

Demographic characteristics of interest were: sex (male/female[1]), age, whether participants identified as Aboriginal or Torres Strait Islander[2] (yes/no), marital status (unmarried/married or de facto), number of dependent children in household (none/1+), employment status (not in the labour force/unemployed/employed), highest qualification obtained (did not finish high school/year 12/certificate or diploma/bachelor degree or higher), socioeconomic status (quintiles coded as per the Socio-Economic Indexes for Areas [27]) and rurality (major cities/regional, rural or remote coded as per the Australian Statistical Geography Standard [28]). Health-related variables included the Kessler-10 scale of psychological distress [29], with response categories collapsed into low-moderate and high-very high, as well as smoking status (current smoker/non-smoker), diagnosis or treatment for any mental health condition in the past 12 months (yes/no) and any illicit drug use in the past 12 months (yes/no).

2.2.2 | Alcohol consumption

The NDSHS asks participants to report on a range of measures related to their alcohol consumption, including how often they have an alcoholic drink of any kind and the number of standard drinks usually consumed per occasion. All participants are subsequently coded as either abstainers, those who drink less than the current Australian guidelines [16] and those who drink more than the guidelines (full details of coding procedures are available elsewhere [30]). The NDSHS also has an additional code for those who drink 'well in excess of the guidelines', defined as the consumption of 11 or more standard drinks on a single occasion [31]. This latter code was utilised in the current study as a measure of 'very high-risk drinking'. Respondents were accordingly categorised in the current analyses as those who drank at these levels at least once per month (very high-risk) and those who consumed alcohol at lower levels or abstained (lower risk).

Survey participants were further asked to report the age at which they had their first full serve of alcohol,

the alcohol beverage type that they drink most often and the location where they usually drink alcohol. The 13 beverage type options provided were collapsed into five categories used in the current analyses: wine, beer, pre-mixed drinks, bottled spirits/liqueurs and cider. Eleven drinking locations were provided in the survey with respondents able to select all that applied. The six most common locations were included in the current study (home/partner's home, friend's house, a party at someone's house, raves/dance parties, restaurants/cafes and licensed premises).

Two proxy measures of 'problematic' drinking were included: whether in the past 3 months (i) participants had unsuccessfully tried to cut down, control or stop drinking; and (ii) whether anyone had expressed concern about their drinking (yes/no). Finally, participants were asked what sort of drinker they would consider themselves: non, ex, occasional, light, social, heavy or binge. For the current study, these categories were collapsed into non-drinkers, ex-drinkers, occasional/light drinkers, social drinkers and heavy/binge drinkers.

2.2.3 | Harm minimisation strategies

Participants were asked to indicate whether they had undertaken any of the following activities during the past 12 months: reduced the amount of alcohol they drink at any one time; reduced the number of times they drink; switched to drinking more low-alcohol drinks than they used to; and/or changed their main drink. They were further asked to indicate their reason(s) for doing so (health, lifestyle, social, pregnant/breastfeeding, taste/enjoyment, drink-driving regulations, financial, adult/parent pressure, peer pressure and price increases). Finally, participants were asked to indicate the frequency with which they undertake a range of harm minimisation strategies when drinking alcohol on a 5-point Likert scale from always to never. Those who selected 'always' or 'most of the time' were included in the current analyses. The harm minimisation strategies were: counting the number of drinks; deliberately alternating between alcoholic and non-alcoholic drinks; making a point of eating while consuming alcohol; quenching thirst by having a non-alcoholic drink before having alcohol; only drinking low-alcohol drinks; limiting the number of drinks consumed in an evening (e.g., when driving) and refusing an offered alcoholic drink when it is unwanted.

2.2.4 | Alcohol-related harms

Participants were asked how harmful or beneficial they perceived their current alcohol consumption to be for their health: very harmful, somewhat harmful, neither

harmful nor beneficial, somewhat beneficial, very beneficial and don't know. For the purposes of the current analyses, these options were collapsed into harmful, neither harmful nor beneficial and beneficial (with those selecting 'don't know' excluded). Participants also recorded whether someone else had been injured due to their drinking, whether they had been verbally abused or put in fear by someone under the influence of alcohol in the past 12 months, and the perpetrator of that incident (relative, spouse, friend or stranger).

2.3 | Analyses

Analyses were conducted in IBM SPSS Statistics v27 and STATA v18 for logistic regression models. SPSS Complex Samples procedures and STATA 'svy' commands were used to account for survey sampling and weighting. Significance levels for all tests were set at $p < 0.05$. Listwise deletion was used with cases containing complete data on the relevant variables.

Exploratory analyses using Crosstabs were undertaken to examine the distribution of variables. Chi-squared analyses tested for significant differences between men and women for categorical variables. Tests of normality indicated that continuous variables (current age and age of initiation of alcohol use) were non-normally distributed. Differences between men and women for these variables were therefore assessed with Mann–Whitney U tests.

Two multivariable logistic regression models were first undertaken to explore relevant demographic and health variables significantly associated with very high-risk drinking in gender-stratified groups. In order to inform the predictor variables included in the models, a series of chi-squared tests (not shown in tables) examined associations between personal characteristics (i.e., age, marital status, whether identify as Aboriginal or Torres Strait Islander, whether have dependent children, educational attainment, employment status, socioeconomic status, rurality, psychological distress, smoking status and illicit drug use) and the outcome measure of very high-risk drinking separately for men and for women. Variables with significant associations were then entered simultaneously in the respective multivariable binary logistic regression models for men and women. The final multivariable model for men used nine predictors (age, marital status, Indigenous status, employment status, socioeconomic status, rurality, psychological distress, smoking status and illicit drug use) and the model for women used eight (age, marital status, Indigenous status, number of dependents, employment status, psychological distress, smoking status and illicit drug use).

In order to assess the role of sex in the relationship between personal characteristics and very high-risk drinking, a third fully adjusted model, including interaction terms with sex was conducted, containing both male and female participants. Individual predictor variables were selected using the same process as above (i.e., chi-squared tests of the association between potential predictors and the outcome measure among the whole sample of women and men) and resulted in the inclusion of nine individual predictors: sex, age, marital status, Indigenous status, employment status, rurality, psychological distress, smoking status and illicit drug use. Potential interaction terms between sex and health/demographic characteristics[3] were also tested for significance in separate regression models which included the other previously selected individual predictor variables. Five interaction terms (age × sex, marital status × sex, rurality × sex, smoking status × sex and illicit drug use × sex) were significant in their respective analyses and included in the final model. To assist interpretation of interaction terms significant in the final model, graphs of predicted margins were generated (using STATA's 'marginsplot' command).

3 | RESULTS

3.1 | Sample characteristics

Among adult women in the current sample, 3.1% reported drinking 11 or more standard drinks on a single occasion at least monthly. This corresponds to 309,182 individuals when data is weighted to be representative of the total Australian population (non-weighted $N = 312$). By contrast, 10.4% or 975,889 men reported drinking at these levels (non-weighted $N = 765$).

Women who drank at very high-risk levels had a median age of 36 years and were typically unmarried (63.6%, 95% confidence interval [CI] = 56.8–69.9) with no dependents (66.4%, 95% CI = 59.4–72.7). Most were employed (71.3%, 95% CI = 64.2–77.5) and lived in major cities (71.7%, 95% CI = 65.4–77.2). Socioeconomic status was relatively evenly distributed throughout the sample. Approximately one-quarter (26.5%, 95% CI = 20.6–33.4) had obtained a Bachelor's Degree or higher, although a substantial minority (16.2%, 95% CI = 11.9–21.8) had not finished high school. Most reported low-moderate levels of psychological distress (64.5%, 95% CI = 57.5–71.0), but almost half (41.2%, 95% CI = 34.5–48.3) had been diagnosed with or treated for a mental health condition in the past 12 months. More than half (53.3%, 95% CI = 46.3–60.3) reported that they had used an illicit drug at least once in the past year and 40.8% (95% CI = 34.2–47.8) smoked tobacco (Table 1).

T A B L E 1 Demographic and health characteristics of men[a] and women[b] who drink at very high-risk levels.

Characteristic		Men % (95% CI)	Women % (95% CI)	Sig
Age, years	Median (range)	39.0 (66)	36.0 (66)	$U = 105{,}901$, $p < 0.01$
Marital status	Unmarried	49.8 (45.2–54.3)	63.6 (56.8–69.9)	$\chi^2 (1, 751) = 15.1$, $p < 0.01$
	Married/de facto	50.2 (45.7–54.8)	36.4 (30.1–43.2)	
Number of dependent children	0	66.4 (61.9–70.6)	66.4 (59.4–72.7)	$\chi^2 (1, 751) = 0$, $p = 0.99$
	1+	33.6 (29.4–38.1)	33.6 (27.3–40.6)	
Employment status	Not in the labour force	13.6 (10.9–16.9)	19.4 (14.3–25.8)	$\chi^2 (2, 1496.6) = 6.6$, $p = 0.09$
	Unemployed	7.1 (5.0–9.9)	9.3 (6.0–14.1)	
	Employed	79.3 (75.5–82.6)	71.3 (64.2–77.5)	
Highest qualification	Did not finish high school	17.7 (14.5–21.4)	16.2 (11.9–21.8)	$\chi^2 (3, 224.6) = 2.2$, $p = 0.65$
	Year 12	23.0 (19.2–27.2)	20.7 (15.2–27.5)	
	Certificate or Diploma	37.3 (33.2–41.5)	36.6 (29.7–44.1)	
	Bachelor Degree+	22.0 (18.7–25.8)	26.5 (20.6–33.4)	
SEIFA	Lowest	19.0 (15.6–22.9)	23.5 (18.1–29.9)	$\chi^2 (4, 2977.2) = 5.7$, $p = 0.37$
	2	23.7 (19.7–28.2)	17.3 (12.2–24.1)	
	3	20.2 (16.4–24.6)	21.5 (16.0–28.2)	
	4	18.7 (15.1–23.0)	18.8 (13.7–25.2)	
	Highest	18.5 (15.1–22.4)	18.9 (13.9–25.3)	
Remoteness	Regional/remote	35.3 (31.5–39.3)	28.3 (22.8–34.6)	$\chi^2 (1, 751) = 4.23$, $p = 0.06$
	Major cities	64.7 (60.7–68.5)	71.7 (65.4–77.2)	
Psychological distress (K10)	Low – moderate	79.6 (75.8–82.9)	64.5 (57.5–71.0)	$\chi^2 (1, 751) = 24.3$, $p < 0.01$
	High – very high	20.4 (17.1–24.2)	35.5 (29.0–42.5)	
Diagnosed with/treated for mental health condition	Yes	19.3 (16.2–22.9)	41.2 (34.5–48.3)	$\chi^2 (1, 751) = 49.1$, $p < 0.01$
	No	80.7 (77.1–83.8)	58.8 (51.7–65.5)	
Smoking status	Current smoker	36.1 (32.1–40.3)	40.8 (34.2–47.8)	$\chi^2 (1, 751) = 1.9$, $p = 0.24$
	Non-smoker	63.9 (59.7–67.9)	59.2 (52.2–65.8)	
Past 12-month illicit drug use	Yes	51.6 (47.3–55.8)	53.3 (46.3–60.3)	$\chi^2 (1, 751) = 0.2$, $p = 0.68$
	No	48.4 (44.2–52.7)	46.7 (39.7–53.7)	

Abbreviations: CI, confidence interval; K10, Kessler Psychological Distress Scale; SEIFA, Socio-Economic Indexes for Areas.

[a]Raw $n = 765$; weighted $n = 975{,}889$. All reported percentages use weighted data.

[b]Raw $n = 312$; weighted $n = 309{,}182$. All reported percentages use weighted data.

Compared to men who drank at very high-risk levels, women were significantly ($p < 0.05$) younger and were more likely to be unmarried. Women who drank at very high-risk levels additionally had significantly higher levels of psychological distress and mental health conditions than men (Table 1).

3.2 | Alcohol consumption

Women reported that they typically began drinking alcohol at 16 years of age, and currently were most likely to drink wine in their own homes. Approximately a quarter had unsuccessfully attempted to reduce their consumption in the past 3 months (28.2%, 95% CI = 22.6–34.6) and/or had someone express concern about their drinking (25.3%, 95% CI = 19.9–31.7). The largest proportion of the sample (37.4%, 95% CI = 30.8–44.4) identified as 'social drinkers'. When compared with men, significant ($p < 0.05$) differences were found in preferred beverage type and self-categorisation (Table 2).

3.3 | Alcohol-related harms and harm minimisation

The majority of the sample (56.8%, 95% CI = 49.0–64.2) considered their drinking to be harmful. Few reported

TABLE 2 Alcohol consumption behaviours of men[a] and women[b] who drink at very high-risk levels.

Alcohol consumption patterns		Men % (95% CI)	Women % (95% CI)	Sig
Age of initiation	Median (range)	15.0 (28)	16.0 (25)	$U = 111{,}565, p = 0.10$
Main beverage type	Wine	12.0 (9.6–15.0)	38.0 (31.3–45.2)	$\chi^2 (4, 2973.7) = 166.7, p < 0.01$
	Beer	63.1 (58.7–67.2)	18.3 (13.7–24.0)	
	Pre-mixed drinks	7.4 (5.4–10.2)	17.1 (11.7–24.4)	
	Bottled spirits and liqueurs	15.7 (12.7–19.3)	22.0 (16.3–29.0)	
	Cider	1.7 (0.9–3.3)	4.6 (2.2–9.0)	
Usual drinking location[c]	Home	83.2 (79.4–86.3)	82.1 (74.9–87.6)	$\chi^2 (1, 751) = 0.1, p = 0.77$
	Friend's house	56.4 (52.2–60.5)	63.6 (56.7–70.0)	$\chi^2 (1, 751) = 4, p = 0.08$
	House party	51.2 (47.0–55.4)	47.7 (40.7–54.8)	$\chi^2 (1, 751) = 0.9, p = 0.42$
	Raves/dance parties	16.3 (13.3–19.9)	18.0 (12.9–24.7)	$\chi^2 (1, 751) = 0.4, p = 0.61$
	Restaurants/cafes	44.6 (40.3–48.9)	47.8 (40.7–55.0)	$\chi^2 (1, 751) = 0.8, p = 0.44$
	Licensed premises	64.7 (60.5–68.7)	63.9 (56.9–70.3)	$\chi^2 (1, 751) = 0, p = 0.85$
Unsuccessfully tried to reduce drinking in past 3 months	Yes	23.9 (20.6–27.6)	28.2 (22.6–34.6)	$\chi^2 (1, 751) = 1.9, p = 0.21$
	No	76.1 (72.4–79.4)	71.8 (65.4–77.4)	
Others expressed concern about drinking	Yes	27.3 (23.6–31.3)	25.3 (19.9–31.7)	$\chi^2 (1, 751) = 0.4, p = 0.59$
	No	72.7 (68.7–76.4)	74.7 (68.3–80.1)	
Self-categorisation	Non drinker	0.9 (0.4–1.8)	2.7 (1.0–6.9)	$\chi^2 (4, 2970.6) = 19.2, p = 0.01$
	Ex drinker	1.0 (0.4–2.1)	1.0 (0.4–2.1)	
	Occasional or light drinker	23.2 (19.7–27.0)	23.2 (19.7–27.0)	
	Social drinker	43.2 (38.9–47.6)	37.4 (30.8–44.4)	
	Heavy or binge drinker	31.8 (28.0–35.9)	27.0 (21.4–33.3)	

Abbreviations: CI, confidence interval.
[a]Raw $n = 765$; weighted $n = 975{,}889$. All reported percentages use weighted data.
[b]Raw $n = 312$; weighted $n = 309{,}182$. All reported percentages use weighted data.
[c]Analyses performed individually as survey respondents could select more than one option.

that someone else had been injured as a consequence of their drinking (4.2%, 95% CI = 2.3–7.5), but higher rates were seen for women's own experiences of alcohol-related verbal abuse (34.9%, 95% CI = 28.5–41.9) and being put in fear by someone under the influence of alcohol (27.5%, 95% CI = 21.2–34.7). Men differed significantly ($p < 0.05$) from women in their experience of being put in fear (reported by only 12.7% of men, 95% CI = 9.9–16.2) and who perpetrated the alcohol-related abuse. Women were more likely to be verbally abused by a relative or spouse, while men were more likely to be verbally abused by a stranger. Similarly, women were more likely to be put in fear by a spouse, while men were typically put in fear by a stranger (Table 3).

Harm minimisation strategies were relatively common among women, particularly limiting the number of drinks consumed on a particular occasion (50.9%, 95% CI = 43.6–58.1) and eating while consuming alcohol (43.9%, 95%

CI = 37.0–51.0). More than a third of women reported that they had reduced the amount (38.1%, 95% CI = 31.4–45.3) or frequency (35.7%, 95% CI = 29.1–42.9) of consumption in the past year, most commonly for health reasons (Table 4).

3.4 | Factors associated with very high-risk consumption

The gender-stratified analysis found that for women, very high-risk drinking (compared to lower-risk drinking) was significantly associated with being younger, being unmarried, having no dependents, having very high psychological distress, smoking and using illicit drugs. Among men, significant variables were: younger age, living in areas of higher socioeconomic status, regional or remote area residence, smoking and illicit drug use (Table 5).

T A B L E 3 Alcohol-related harms experienced by men[a] and women[b] who drink at very high-risk levels.

Alcohol-related harms		Men % (95% CI)	Women % (95% CI)	Sig
Perceived harmfulness of consumption	Harmful	52.6 (48.0–57.2)	56.8 (49.0–64.2)	$\chi^2 (2, 1491.7) = 1.3, p = 0.64$
	Neither harmful nor beneficial	36.4 (32.1–40.9)	32.6 (25.7–40.4)	
	Beneficial	11.0 (8.6–14.0)	10.6 (6.8–16.3)	
Has someone else been injured because of your drinking?	Yes	4.7 (3.3–6.6)	4.2 (2.3–7.5)	$\chi^2 (1, 751) = 0.1, p = 0.77$
	No	95.3 (93.4–96.7)	95.8 (92.5–97.7)	
Experienced alcohol-related verbal abuse	Yes	33.7 (29.5–38.3)	34.9 (28.5–41.9)	$\chi^2 (1, 751) = 0.1, p = 0.77$
	No	66.3 (61.7–70.5)	65.1 (58.1–71.5)	
Perpetrator of alcohol-related verbal abuse	Parent, child, sibling or other relative	7.0 (4.2–11.5)	16.6 (9.3–28.0)	$\chi^2 (1, 751) = 6.8, p = 0.03$
	Current or ex-spouse, partner or boy/girlfriend	13.2 (9.0–18.8)	37.1 (26.9–48.7)	$\chi^2 (1, 751) = 23.6, p < 0.01$
	Friend, work/school mate, flat/house mate or other known person	35.1 (28.0–43.0)	35.8 (25.2–48.0)	$\chi^2 (1, 751) = 0, p = 0.93$
	A stranger	64.8 (57.2–71.8)	38.6 (28.0–50.3)	$\chi^2 (1, 751) = 18, p < 0.01$
Put in fear	Yes	12.7 (9.9–16.2)	27.5 (21.2–34.7)	$\chi^2 (1, 751) = 29.2, p < 0.01$
	No	87.3 (83.8–90.1)	72.5 (65.3–78.8)	
Perpetrator of being put in fear	A parent, child, sibling or other relative	6.2 (2.4–15.1)	9.2 (4.4–18.3)	$\chi^2 (1, 751) = 0.5, p = 0.52$
	A current or ex-spouse, partner or boy/girlfriend	4.3 (1.6–10.9)	16.2 (9.2–27.0)	$\chi^2 (1, 751) = 6.3, p = 0.01$
	A friend, work/school mate, flat/house mate or other known person	26.7 (16.1–40.9)	38.9 (25.7–54.0)	$\chi^2 (1, 751) = 2.6, p = 0.22$
	A stranger	82.1 (71.1–89.5)	62.5 (48.2–74.9)	$\chi^2 (1, 751) = 7.4, p = 0.02$

Abbreviation: CI, confidence interval.
[a]Raw $n = 765$; weighted $n = 975,889$. All reported percentages use weighted data.
[b]Raw $n = 312$; weighted $n = 309,182$. All reported percentages use weighted data.

In the fully adjusted model containing both men and women as well as interaction terms with sex, significant individual predictors of very high-risk drinking were being younger (i.e., all older age groups had lower odds of very high-risk drinking than 18- to 24-year-olds), being employed, living in a regional or remote area, having higher levels of psychological distress, smoking, using illicit drugs and being male (Table 6).

Sex was found to interact significantly at $p < 0.05$ in the fully adjusted model with age, marital status, rurality and smoking. Specifically, steep declines in the likelihood of very high-risk drinking were seen among men after the age of 24 (and again after 54). By contrast, steep declines were only seen among women after age 44. Likelihood of very high-risk drinking also declined to a greater degree with marriage among women than men. Place of residence (rural vs. metropolitan) did not impact

very high-risk drinking among women, but men who lived in rural areas were more likely to drink at very high-risk levels than their metropolitan counterparts. Finally, the significant smoking × sex interaction ($p = 0.01$) graph of predictive margins showed similar slopes for both women and men. Subsequent investigative analyses found non-parallel slopes for women and men when the main effects for smoking and sex were only included in the model (data not shown), indicating that other main effects likely obscured the interaction in the fully adjusted model (Supporting Information, S1).

4 | DISCUSSION

The current study is the first to profile the alcohol-related behaviours of Australian women in the general

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T A B L E 4 Harm minimisation strategies utilised by men[a] and women[b] who drink at very high-risk levels.

Harm minimisation strategies		Men % (95% CI)	Women % (95% CI)	Sig
In the last 12 months, have you ...	Reduced the amount of alcohol you drink at any one time?	34.7 (30.9–38.8)	38.1 (31.4–45.3)	$\chi^2 (1, 751) = 1, p = 0.41$
	Reduced the number of times you drink?	36.2 (32.3–40.3)	35.7 (29.1–42.9)	$\chi^2 (1, 751) = 0, p = 0.89$
	Switched to drinking more low-alcoholic drinks than you used to?	7.4 (5.6–9.7)	5.0 (2.9–8.6)	$\chi^2 (1, 751) = 1.8, p = 0.21$
	Changed your main drink?	6.4 (4.5–9.0)	7.7 (4.7–12.3)	$\chi^2 (1, 751) = 0.5, p = 0.54$
Reasons for doing the above	Health	58.2 (52.6–63.6)	58.6 (49.1–67.5)	$\chi^2 (1, 751) = 0, p = 0.93$
	Lifestyle	44.2 (38.8–49.8)	47.1 (37.5–57.0)	$\chi^2 (1, 751) = 0.4, p = 0.61$
	Social	26.9 (22.1–32.4)	39.3 (30.3–49.2)	$\chi^2 (1, 751) = 8.2, p = 0.02$
	Pregnant/breastfeeding	0.3 (0.0–1.8)	6.1 (2.7–13.0)	$\chi^2 (1, 751) = 22.7, p < 0.01$
	Taste/enjoyment	8.5 (6.0–11.8)	8.6 (4.8–14.7)	$\chi^2 (1, 751) = 0, p = 0.97$
	Drink driving regulations	13.1 (9.9–17.2)	8.5 (4.6–15.0)	$\chi^2 (1, 751) = 2.2, p = 0.18$
	Financial	23.5 (18.7–29.1)	26.4 (17.8–37.3)	$\chi^2 (1, 751) = 0.5, p = 0.60$
	Adult/parent pressure	4.7 (2.8–7.9)	3.5 (1.6–7.8)	$\chi^2 (1, 751) = 0.4, p = 0.55$
	Peer pressure	2.2 (1.0–4.7)	3.9 (1.6–9.2)	$\chi^2 (1, 751) = 1.2, p = 0.33$
	Price increases	9.3 (6.7–12.7)	4.3 (1.9–9.7)	$\chi^2 (1, 751) = 3.7, p = 0.08$
When drinking, 'always' or 'most of the time' ...	Count the number of drinks	31.3 (27.5–35.4)	26.6 (20.8–33.3)	$\chi^2 (1, 751) = 2, p = 0.22$
	Deliberately alternate between alcoholic and non-alcoholic drinks	7.4 (5.4–9.9)	9.9 (6.5–14.6)	$\chi^2 (1, 751) = 1.6, p = 0.25$
	Make a point of eating while drinking	41.8 (37.6–46.2)	43.9 (37.0–51.0)	$\chi^2 (1, 751) = 0.3, p = 0.63$
	Quench your thirst by having a non-alcoholic drink before having alcohol	21.3 (18.0–24.9)	27.6 (21.9–34.2)	$\chi^2 (1, 751) = 4.4, p = 0.07$
	Only drink low-alcohol drinks	4.6 (3.3–6.3)	4.4 (2.5–7.8)	$\chi^2 (1, 751) = 0, p = 0.93$
	Limit the number of drinks you have in an evening	55.5 (51.1–59.7)	50.9 (43.6–58.1)	$\chi^2 (1, 751) = 1.6, p = 0.28$
	Refuse an alcoholic drink you are offered because you really don't want it	32.5 (28.6–36.7)	37.3 (30.4–44.7)	$\chi^2 (1, 751) = 1.9, p = 0.25$

Abbreviation: CI, confidence interval.
[a]Raw $n = 765$; weighted $n = 975,889$. All reported percentages use weighted data.
[b]Raw $n = 312$; weighted $n = 309,182$. All reported percentages use weighted data.

population who drink at very high-risk levels. As expected and consistent with previously published national data [31], a greater proportion of men were found to consume alcohol at very high-risk levels than women. Nevertheless, results indicate that a large absolute number of Australian women are also drinking at very high rates. Furthermore, the characteristics of these women appear to be different from their male counterparts in a number of respects. Specifically, women are more likely to be younger, unmarried,

experience high to very high psychological distress, and have a mental health condition compared to men who drink at similar levels. Healthcare provision has a long history of catering specifically to men with little consideration given to the important biological and sociological ways in which women may differ [32–34]. It is imperative that the alcohol field does not fall into this trap, and that health promotion initiatives and treatment programs are cognisant of the unique characteristics of women.

TABLE 5 Factors that predict very high-risk (compared to lower risk) drinking among men[a] and women.[b]

	Men				Women			
			95% CI				95% CI	
	p	OR	Lower	Upper	*p*	OR	Lower	Upper
Age (RC: 18–24), years	<0.001				<0.001			
25–34		0.68	0.49	0.96		0.94	0.55	1.60
35–44		0.61	0.42	0.87		0.98	0.56	1.71
45–54		0.59	0.41	0.85		0.45	0.24	0.83
55–64		0.44	0.30	0.64		0.18	0.08	0.39
65+		0.12	0.07	0.19		0.17	0.08	0.37
Marital status (RC: married)	0.56				0.02			
Unmarried		1.07	0.85	1.35		1.54	1.06	2.24
Indigenous status (RC: not Indigenous)	0.82				0.72			
Indigenous		0.93	0.49	1.75		1.13	0.58	2.18
Dependents (RC: 1+)	–				0.004			
No dependents						1.79	1.21	2.64
Employment status (RC: Employed)	0.12				0.12			
Unemployed/not in the labour force		0.81	0.61	1.06		0.73	0.50	1.08
Socioeconomic status (RC: Lowest)	0.02				–			
2		1.66	1.22	2.27				
3		1.42	1.02	1.96				
4		1.22	0.87	1.71				
Highest		1.42	1.02	1.97				
Rurality (RC: Major cities)	<0.001				–			
Regional/remote		1.79	1.44	2.22				
Psychological distress (RC: low-moderate)	0.06				0.03			
High-very high		1.34	0.99	1.80		1.53	1.04	2.26
Smoking status (RC: non-smoker)	<0.001				<0.001			
Smoker		1.66	1.30	2.13		2.79	1.92	4.06
Illicit drug use (RC: none)	<0.001				<0.001			
Yes—in past year		3.69	2.94	4.63		3.74	2.59	5.41

Abbreviations: CI, confidence interval; OR, odds ratio; RC, reference category; –, term not significant in univariate analysis and not included in multivariable model.

[a]Raw *n* = 8579; weighted *n* = 8,493,577. Analyses conducted using weighted data.

[b]Raw *n* = 9898; weighted *n* = 8,042,292. Analyses conducted using weighted data.

As for men, women were found to typically drink in their own homes, although consumption at friends' houses and licensed premises was also common. It is possible that women who drink at very high-risk levels are doing so at home in order to save money (noting that women are disproportionately vulnerable to financial hardship [35]), and/or in order to cope with the high rates of psychological distress and mental health concerns found among this group (rather than in the context of a social event). However, these explanations must necessarily be speculative given the lack of data in the NDSHS regarding drinking motivations. In general, there is a relative paucity of literature concerning gender differences in drinking motivations among heavy drinking adults in the general population. Establishing the precise factors that motivate women to drink heavily would provide important data to inform the development of interventions and health promotion activities.

In terms of preferred beverage type among those who drank at very high-risk levels, women typically drank wine, while men usually consumed beer. This is consistent with population groups who drink at low-risk

TABLE 6 Factors that predict very high-risk (compared to lower risk) drinking among the full sample.[a]

	p	OR	95% CI Lower	Upper
Sex (RC: men)	<0.001			
Women		0.21	0.11	0.37
Age (RC: 18–24), years				
25–34	<0.001	0.67	0.48	0.94
35–44		0.59	0.41	0.86
45–54		0.59	0.41	0.84
55–64		0.44	0.30	0.64
65+		0.12	0.08	0.20
Age × sex (RC: 18–24 men)				
18–24 women		0.21	0.11	0.37
25–34 women	0.01	0.28	0.18	0.44
35–44 women		0.28	0.18	0.42
45–54 women		0.15	0.09	0.25
55–64 women		0.09	0.04	0.18
65+ women		0.38	0.17	0.85
Marital status (RC: married)	0.56			
Unmarried		1.07	0.85	1.35
Marital status × sex (RC: unmarried men)	0.04			
Unmarried women		0.32	0.19	0.53
Indigenous status (RC: not Indigenous)	0.86			
Indigenous		1.04	0.64	1.69
Employment status (RC: employed)	0.01			
Unemployed/not in the labour force		0.73	0.59	0.91
Rurality (RC: major cities)	<0.001			
Regional/rural/remote		1.73	1.40	2.14
Rurality × sex (RC: regional/rural/remote men)	0.01			
Regional/rural/remote women		0.13	0.06	0.25
Psychological distress (RC: low-moderate)	0.01			
High-very high		1.38	1.09	1.75
Smoking status (RC: non-smoker)	<0.001			
Smoker		1.63	1.27	2.08
Smoking status × sex (RC: smoking men)	0.01			
Smoking women		0.35	0.16	0.75
Illicit drug use (RC: non-user)	<0.001			
Used in past year		3.69	2.93	4.63
Illicit drug use × sex (RC: used in past year men)	0.49			
Used in past year women		0.24	0.12	0.45

Abbreviations: CI, confidence interval; OR, odds ratio; RC, reference category.

[a]Raw $n = 19,064$; weighted $n = 17,286,120$. Analyses conducted using weighted data.

levels [31], but is somewhat incongruous given that individuals who drink at very high-risk levels may have been expected to prefer beverages with higher alcohol concentrations. These preliminary results suggest that gender norms regarding socially acceptable drinks for men and women still hold considerable sway within

heavy drinking populations. It is also possible that the relatively lower cost of wine/beer may be contributing to a consistent preference for these beverages. It is well established that the current alcohol taxation system is not evidence-based and results in disproportionately low costs for some alcohol types [36]. A more coherent model with higher prices for beer and wine may therefore be an effective policy lever for addressing very high-risk alcohol consumption (noting that care must be taken to avoid transference to low-cost higher-potency beverages, as well as disproportionate effects on disadvantaged populations).

The current sample of women appeared to be aware—at least to a certain extent—of the potential harms associated with their drinking. A quarter reported that they had unsuccessfully attempted to reduce their consumption. The treatment seeking behaviours of this group of women—and how they can best be supported to engage with treatment services—is therefore an important avenue of future research. Similarly, most reported that their current consumption levels were harmful, and that others had expressed concern about their drinking. Despite this, the largest proportion of women self-identified as 'social drinkers', with another quarter characterising their drinking as 'occasional or light'. Given the social sanctions that persist for women drinking alcohol, particularly at high levels [37], this may reflect a reluctance to openly label their consumption as problematic. Alternatively, it may reflect a belief that others are also drinking at these levels (i.e., that their consumption is harmful, but normative). A small proportion of women also characterised themselves as either non- or ex-drinkers. It is possible that this reflects a very recent commitment to cease drinking, but it may also again indicate a reluctance or inability to accurately self-categorise. Regardless of the underlying explanation, inaccurate self-categorisation has implications for help-seeking behaviours, and may result in some women not receiving appropriate care for their level of consumption.

The use of harm-minimisation strategies was generally consistent between women and men, although prevalence varied widely depending on the strategy in question. However, even the most prevalent harm minimisation strategy was endorsed by only half of the female sample. The low uptake of harm minimisation strategies is unsurprising among this very heavy drinking population, but the finding that a total of 50% of very high-risk drinkers consciously limit their drinks is cause for optimism. Further exploration of how, when and why people who drink at very high-risk levels engage in harm minimisation may assist ongoing work to identify and promote acceptable (and non-stigmatising) harm minimisation strategies for this population. For example, future research could explore the extent to which concerns regarding alcohol dependence act as a catalyst for implementing harm minimisation strategies; intuitively this appears likely, but was not able to be examined in the present study due to limitations in the response options of the NDSHS.

It is acknowledged that many of the behaviours and characteristics of very high-risk female drinkers examined here are likely to reflect established gender differences within the general population of lower-risk drinkers. However, in examining the extent and nature of the differences (or similarities) between very high-risk and other drinkers, it is hoped that the present research will assist in informing future initiatives targeting the former group specifically.

These results highlight important differences in the relationship between personal characteristics and very high-risk drinking for women and for men. In the logistic regression model containing both male and female participants and the interactions with sex, six individual variables predicted very high-risk drinking (age, employment status, rurality, psychological distress, smoking and illicit drug use) in addition to sex and the interaction terms. However, only three of these individual predictors (age, smoking and illicit drug use) were significant predictors in both the male and female gender-stratified samples. In addition, another two variables were significant for one sex (marital status and dependents for women, and SES for men), but not in the overall sample. The former may reflect social norms and pressures related to family that are not present for men. For example, women are more likely to undertake a larger proportion of parenting and household duties, and to face stigma for perceived parenting failures [38–40]. Having fewer opportunities to drink heavily and/or experiencing social sanctions for doing so may therefore discourage very high-risk consumption. Overall, the variability of these results reiterates the importance of basing public health policies and initiatives targeting women on appropriate data, and highlights the potential dangers of extrapolating gender-specific messages from population-wide analyses.

The relationships between age, marital status, rurality, and smoking and very high-risk drinking were also found to vary according to sex. Specifically, very high-risk drinking was concentrated among 18- to 24-year-old men, but was equally likely among young adults and middle-aged women up to 44 years. Identifying and targeting the precise underlying causes of these differential heavy drinking patterns and tailoring interventions to address them is an important avenue of future research. For example, it is possible that the minority of women who drink at very high-risk levels may be a particularly vulnerable group who are not naturally 'ageing out' of these behaviours in the same way as men (who are more likely to drink heavily than women at all ages).

Marital status did not appear to substantially affect the likelihood of men drinking at very high-risk levels, but among women, those who were unmarried were more likely to do so. Gender norms regarding the acceptability of certain behaviours for different segments of society are pervasive; it is possible that drinking to excess is more likely to be perceived as common and appropriate for men regardless of age, but more likely to be stigmatised among women who have married and 'settled down'. The importance of rurality for men, but not women, could similarly indicate that gender norms regarding the acceptability of heavy drinking may diverge more strongly outside of metropolitan areas.

Smoking status was also found to interact significantly with sex, although the precise nature of the interaction remains unclear from the present analyses. Further research is needed to examine the relationship between smoking and very high-risk drinking among women specifically, including potential (three-way) interactions with other alcohol-related or demographic variables.

Overall, predictors of very high-risk drinking not only vary considerably depending upon the gender composition of the sampling frame used, but also interact significantly with sex. These results highlight the importance of taking into consideration the gender-specific conditions and motivations regarding alcohol consumption patterns, prevention and treatment, and suggest that doing so would be of benefit to both women and men.

4.1 | Limitations

The NDSHS asks participants to record their own alcohol consumption and related behaviours, and as such the usual caveats associated with self-reported data apply to the present study. Previous research has estimated that alcohol consumption may be under-reported among middle-aged women in the NDSHS by as much as 49% [41]; the estimated prevalence of very heavy drinking presented here should therefore be considered conservative. Although the data is weighted to be representative of the national population, the sample size of very high-risk drinkers is also acknowledged to be low. Furthermore, the comparison group of 'lower risk drinkers' utilised in the present study was very broad and contained both abstainers and those who drank heavily, but infrequently. Results of the current study would therefore benefit from further investigation, including replication with different comparison groups (such as moderate and lower-risk drinkers). Finally, only those who identified their sex as 'female' or 'male' were included in the current dataset. The alcohol-related behaviours and experiences of transgender, non-binary and gender-diverse people remain important for continued future research.

4.2 | Conclusion

A substantial number of Australian women are regularly drinking at very high-risk levels. Men and women who drink at very high levels have distinct health and demographic characteristics, with different variables associated with consumption. As such, a one-size-fits-all approach to the identification, prevention and treatment of alcohol-related harms in this very high-risk group may be neither appropriate nor successful.

These results provide the first nationally representative picture of Australian women who drink at very high-risk levels. Considerable work remains to be done in this space, but it is hoped the present results will provide a foundation to inform future research regarding heavy consumption practices among women. An important next step will be comparing the characteristics of this group with women who drink at lower risk levels. In the meantime, the present results support calls for increased attention on tailored strategies to prevent and manage very high-risk consumption among women [42], with a particular focus on the ways in which sex (and gender) can affect responses to treatment, policies and health promotion messages [43].

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ENDNOTES

1. Data regarding participants who reported another gender identity were not available in the dataset for confidentiality reasons.

2. Not included within crosstabs analyses due to National Drug Strategy Household Survey restrictions on the use of this variable.

3. An interaction term was not created for Indigenous status as per usage restrictions on this variable from the data custodian.

REFERENCES

1. WHO. Global status report on alcohol and health 2018. Geneva: World Health Organization; 2018.
2. AIHW. Australian Burden of Disease Study 2018: key findings. Canberra: Australian Institute of Health and Welfare; 2021.
3. AIHW. National Drug Strategy Household Survey. Canberra: Australian Institute of Health and Welfare; 2020.
4. AIHW. Alcohol and other drug treatment services in Australia annual report. Canberra: Australian Institute of Health and Welfare; 2021.
5. Crosland P, Ananthapavan J, Davison J, Lambert M, Carter R. The economic cost of preventable disease in Australia: a systematic review of estimates and methods. Aust N Z J Public Health. 2019;43:484–95.
6. Richter L. Alcohol and women: unique risks, effects, and implications for clinical practice. Neuroscience of alcohol: mechanisms and treatment. London: Academic Press, Elsevier; 2019. p. 21–8.
7. Bratberg GH, C Wilsnack S, Wilsnack R, Håvås Haugland S, Krokstad S, Sund ER, et al. Gender differences and gender convergence in alcohol use over the past three decades (1984–2008), The HUNT Study, Norway. BMC Public Health. 2016; 16:723.
8. McPherson M, Casswell S, Pledger M. Gender convergence in alcohol consumption and related problems: issues and outcomes from comparisons of New Zealand survey data. Addiction. 2004;99:738–48.
9. Keyes KM, Grant BF, Hasin DS. Evidence for a closing gender gap in alcohol use, abuse, and dependence in the United States population. Drug Alcohol Depend. 2008;93:21–9.
10. Stanesby O, Jayasekara H, Callinan S, Room R, English D, Giles GG, et al. Women's role in the rise in drinking in Australia 1950–80: an age–period–cohort analysis of data from the Melbourne Collaborative Cohort Study. Addiction. 2018; 113:2194–202.
11. Rodriguez LM, Litt DM, Stewart SH. Drinking to cope with the pandemic: the unique associations of COVID-19-related perceived threat and psychological distress to drinking behaviors in American men and women. Addict Behav. 2020;110: 106532.
12. Acuff SF, Strickland JC, Tucker JA, Murphy JG. Changes in alcohol use during COVID-19 and associations with contextual and individual difference variables: a systematic review and meta-analysis. Psychol Addict Behav. 2022;36:1–19.
13. AIHW. Alcohol and other drug treatment services in Australia 2018–19: supplementary data tables. Canberra: Australian Institute of Health and Welfare; 2020.
14. AIHW. National Hospital Morbidity Database 2018–19. Canberra: Australian Institute of Health and Welfare; 2020.
15. ABS. Causes of death, Australia 2019. Canberra: Australian Bureau of Statistics; 2020.
16. National Health and Medical Research Council. Guidelines to reduce health risks from drinking alcohol. Canberra: NHMRC; 2020.
17. Green CA. Gender and use of substance abuse treatment services. Alcohol Res Health. 2006;29:55–62.
18. Brighton R, Moxham L, Traynor V. Women and alcohol use disorders: factors that lead to harm. J Addict Nurs. 2016;27: 205–13.
19. Greenfield SF. Women and alcohol use disorders. Harv Rev Psychiatry. 2002;10:76–85.
20. Alvanzo AAH, Storr CL, Mojtabai R, Green KM, Pacek LR, La Flair LN, et al. Gender and race/ethnicity differences for initiation of alcohol-related service use among persons with alcohol dependence. Drug Alcohol Depend. 2014;140:48–55.
21. Greenfield SF, Brooks AJ, Gordon SM, Green CA, Kropp F, McHugh RK, et al. Substance abuse treatment entry, retention, and outcome in women: a review of the literature. Drug Alcohol Depend. 2007;86:1–21.
22. Zemore SE, Murphy RD, Mulia N, Gilbert PA, Martinez P, Bond J, et al. A moderating role for gender in racial/ethnic disparities in alcohol services utilization: results from the 2000 to 2010 National Alcohol Surveys. Alcohol Clin Exp Res. 2014;38:2286–96.
23. Greenfield TK, Ye Y, Bond J, Kerr WC, Nayak MB, Kaskutas LA, et al. Risks of alcohol use disorders related to drinking patterns in the U.S. general population. J Stud Alcohol Drugs. 2014;75:319–27.
24. National Drug Strategy Household Survey 2019: confidentialised unit record file [Internet]. ADA Dataverse; 2021. Available from: https://doi.org/10.26193/WRHDUL.
25. Australian Institute of Health and Welfare. National Drug Strategy Household Survey 2016: detailed findings. Canberra: Government of Australia; 2017.
26. Australian Institute of Health and Welfare. National Drug Strategy Household Survey 2019. Canberra: AIHW; 2020.
27. Australian Bureau of Statistics. 2033.0.55.001—Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2016. Canberra: ABS; 2018.
28. Australian Bureau of Statistics. Australian Statistical Geography Standard (ASGS) Edition 3. Canberra: ABS; 2021.
29. Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, et al. Screening for serious mental illness in the general population. Arch Gen Psychiatry. 2003;60:184–9.
30. Australian Institute of Health and Welfare. 2019 NDSHS technical informaiton. Canberra: AIHW; 2020.
31. Australian Institute of Health and Welfare. National Drug Strategy Household Survey 2019. Drug Statistics series no. 32. PHE 270. Canberra: AIHW; 2020.
32. Lloyd EP, Paganini GA, ten Brinke L. Gender stereotypes explain disparities in pain care and inform equitable policies. Policy Insights Behav Brain Sci. 2020;7:198–204.
33. Sebring JCH. Towards a sociological understanding of medical gaslighting in western health care. Sociol Health Illn. 2021;43: 1951–64.
34. Weyand AC, James PD. Sexism in the management of bleeding disorders. Res Pract Thromb Haemost. 2021;5:51–4.
35. Aisa R, Larramona G, Pueyo F. Poverty in Europe by gender: the role of education and labour status. Econ Anal Policy. 2019;63:24–34.
36. Howard SJ, Gordon R, Jones SC. Australian alcohol policy 2001–2013 and implications for public health. BMC Public Health. 2014;14:848.

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37. Schamp J, Simonis S, Roets G, Van Havere T, Gremeaux L, Vanderplasschen W. Women's views on barriers and facilitators for seeking alcohol and drug treatment in Belgium. Nordisk Alkohol Nark. 2021;38:175–89.

38. Ciciolla L, Luthar SS. Invisible household labor and ramifications for adjustment: mothers as captains of households. Sex Roles. 2019;81:467–86.

39. Forbes LK, Donovan C, Lamar MR. Differences in intensive parenting attitudes and gender norms among U.S. mothers. Fam J. 2020;28:63–71.

40. Meeussen L, Van Laar C. Feeling pressure to be a perfect mother relates to parental burnout and career ambitions. Front Psychol. 2018;9:2113.

41. Livingston M, Callinan S. Underreporting in alcohol surveys: whose drinking is underestimated? J Stud Alcohol Drugs. 2015;76:158–64.

42. Brasiliano S, Kachani AT, Carezzato F, Hochgraf PB. Alcohol and substance use disorders in women. In: Rennó J Jr, Valadares G, Cantilino A, Mendes-Ribeiro J, Rocha R, Geraldo da Silva A, editors. Women's mental health: a clinical and evidence-based guide. Cham: Springer International Publishing; 2020. p. 191–214.

43. Greaves L. Missing in action: sex and gender in substance use research. Int J Environ Res Public Health. 2020;17:2352.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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