



Research Paper

Risky alcohol use and violence against women: cause or consequence?

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ABSTRACT

Aim: The aim of the current study was to determine (a) whether there is a relationship between the quantity of alcohol consumed by a woman when drinking alcohol and the risk of physical violence and (b) whether experiencing physical violence increases the quantity of alcohol consumed by a woman.

Methods: The research questions were addressed by fitting a series of random and fixed effect logistic regression models to data drawn from 22 waves of the HILDA survey, a nationally representative longitudinal survey of Australian households. The dataset for the current study involves 143,517 survey responses from 15,934 women. We examine (1) the cross-sectional relationship between alcohol use and physical violence among women (2) the relationship between alcohol use (or violence) at wave t and physical violence (or alcohol use) at wave $t + 1$ and (3) the within-subject relationship between alcohol use and physical violence (and vice versa).

Results: The risk of is nine per cent for a woman who consumes 1–2 standard drinks at a sitting, 15 per cent for a woman who consumes 7 to 8 standard drinks at a sitting and 20 per cent for a woman who normally consumes 13 or more standard drinks at a sitting. Controlling for other factors, a woman who reports having been assaulted in the previous 12 months consumes an average of 13 per cent more alcohol at a sitting than a woman who has not been assaulted in the previous 12 months.

Conclusion: Prevention resources are always limited and are therefore best targeted at those who are most at risk, regardless of whether the correlate plays a causal role or is simply a signal of heightened risk. Women reporting they have been assaulted to health, welfare or criminal justice authorities should be assessed to determine whether they also have concurrent drug and alcohol problems.

Introduction

Violence against women is a global public health issue. Estimates published by the World Health Organization (2025) suggest that about 1 in 3 (30 %) women worldwide have been subjected to either physical and/or sexual intimate partner violence or non-partner sexual violence in their lifetime. The effects of such violence include attempted suicide, neurologic and other physical injury, post-traumatic stress disorder, homelessness, clinical depression, unemployment, poor educational outcomes, and increased risk of communicable disease (AIHW, 2024; Devries et al., 2013; Campbell & Lewandowski, 1997; Bacchus et al., 2018; Summers et al., 2025). In 2016, KPMG estimated the cost of physical and sexual violence against women in Australia in 2015–16 at \$22 billion (KPMG, 2016).

Systematic reviews of research on the relationship between alcohol consumption and violence against women generally find a strong

association (Devries et al., 2013; Fals-Stewart et al., 2005; Ramsoomar et al., 2021; Foran & O'Leary, 2008). Most of the research cited in these reviews has focused on the role of alcohol consumption by men rather than the effect of alcohol consumption by women, however a small number of studies have investigated the association between alcohol consumption by women and their experience of violence (e.g., Miller, Downs & Gondoli, 1989; Lipsky et al., 2005; Thompson & Kingree, 2006; Connor et al., 2011; Stavrou et al., 2016; Weatherburn, 2011; Smith & Weatherburn, 2013). Most of these studies have been cross-sectional. This makes it impossible to separate cause from effect. Further, because many factors besides alcohol use are associated with becoming a victim of violence, cross-sectional studies are vulnerable to omitted variable bias (confounding). Failure to control for extraneous factors can lead to spurious inferences about the nature of the relationship between alcohol use by a woman and her risk of being assaulted.

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One way to minimize internal threats to validity of the kind just described is to employ a fixed effect panel design. Studies of this kind examine the temporal relationship between dependent and independent variables within rather than between individuals. This has the effect of controlling for all time constant differences between individuals.¹ Although fixed effect panel studies of violence against women have been conducted before (e.g., Tolman & Wang, 2005), we have only been able to locate one previous study that has adopted this approach in relation to alcohol consumption by women and their experience of physical assault. Smith and Weatherburn (2013) used this design to examine the effect of drinking frequency, personal stress, financial stress, and social support on the risk of a woman experiencing and assault. They followed a cohort of 9393 women interviewed every year over a period of six years as part of the Australian Household Income and Labor Dynamics (HILDA) survey (Melbourne Institute 2025). The results confirmed the importance of personal stress, financial stress, and social support as causal risk factors for physical violence but found no effect of alcohol use by a woman on the risk of her being assaulted.

In this article we report the results of a study into the relationship between alcohol consumption by a woman and the risk she will become a victim of violence. The study is not limited to intimate partner or family violence. Our analysis includes women who experience violence, regardless of whether the offender is someone known to them or a complete stranger. We focus on the relationship between violence and alcohol consumption by women partly because, if we want reduce violence against women it helps to know what puts a person at risk of becoming a victim of violence or protects them from it, partly because it is a neglected area of research and partly because existing results are somewhat conflicting (c.f. Smith & Weatherburn, 2013; Devries et al., 2013; Yakubovich et al., 2018). As Coumarelos and Allen (1998) pointed out almost ten years ago: 'Identifying women who are particularly at risk of violence is important from the point of view of prevention. Given that the risk of victimization can vary considerably for different women, violence prevention may be better achieved by concentrating resources on prevention programs that target high-risk groups of women rather than by spreading resources more thinly across prevention programs that target all women.'

We therefore seek answers to two key questions of importance to preventing violence against women:

1. Does the risk of violence against women increase with the quantity of alcohol they consumed at a given sitting or subsequently, after controlling for other potential causes of violence against women?
2. Does becoming a victim of violence increase the amount of alcohol a woman consumes at a given sitting after controlling for other factors that might increase alcohol consumption?

We follow Smith and Weatherburn (2013) in using data from the HILDA survey and in employing a fixed effect panel analysis to analyze the data. We improve on Smith and Weatherburn (2013), however, in three ways. First we examine a representative sample of women from HILDA interviewed annually over a period of twenty rather than just six years. Secondly we examine lagged effects as well as contemporaneous effects. Thirdly, we test the effect of violence on alcohol use as well as the effect of alcohol use on violence. In the next section of this article, we describe our methods in greater detail. We emphasize at the outset that we do not pursue this line of enquiry to provide men with an excuse for violence against women or to diminish their culpability for engaging in such violence. We focus on the relationship between violence and

alcohol consumption by women because it is a neglected area of research, because existing results are somewhat conflicting (c.f. Smith & Weatherburn, 2013; Devries et al., 2013; Yakubovich et al., 2018) and because, if we want reduce violence against women it helps to know what puts a person at risk of becoming a victim of violence or protects them from it.

Method

Approval for the current study was granted by the UNSW Human Research Ethics Committee (HC: iRECS6957 on 19/6/2024).

Data

The study uses data from waves 2 to 21 of the HILDA survey. Summerfield et al. (2024) provide full details of the HILDA survey. It suffices to note here that the HILDA Survey began in 2001 with a large national probability sample of Australian households occupying private dwellings. All members of the households aged over fifteen who provided at least one interview in wave one formed the basis of the panel to be pursued in each subsequent wave. The sample includes anyone who subsequently became a new member of a household already included in the survey (e.g., a new partner). HILDA does not include people living in non-private dwellings, such as hospitals, hotels, and prisons. The parent dataset for the current study involves 143,517 survey responses from 15,934 individuals, however the effective sample varies depending on the nature of the analysis (and is indicated in that context). The wave-on-wave response rate was 86.9 per cent in wave two but has remained over 90 per cent in all subsequent waves (Wilkins et al., 2024).

HILDA includes a household survey—which is administered in person by an interviewer—and a self-completion questionnaire (SCQ). The SCQ contains questions involving sensitive matters which respondents may prefer to answer without an interviewer present. All measures in the current study, except sex, age and marital status were obtained from the SCQ. The variables sex, age and marital status were obtained from the household questionnaire. To be included in the study, a respondent had to be female, aged 15 or more on the 30th of June in the year of the survey for wave t (which ranges between 2002 and 2021), have responded to both the person questionnaire and self-completion questionnaire and have given a valid response to whether she was a victim of physical violence. Only 1.6 per cent of the records for the study were missing information on the question on physical violence. The records of individuals who failed to respond to this item were dropped from the analysis.

Variables

Dependent variable

The dependent variable in the analysis is obtained from section B27 of the self-completion questionnaire, which begins with the words:

'We now would like you to think about major events that have happened in your life over the past 12 months. For each statement [among those listed below this introduction] cross either the YES box or the NO box to indicate whether each event happened during the past 12 months.'

Item k in the list reads as follows: k. Victim of physical violence (e.g., assault).

If a female respondent ticks the 'yes' box to this question, we treat the respondent as a victim of assault. The dependent variable in the study (*victim of physical violence*) is a binary variable coded '1' if the woman reports being a victim of physical violence in the last 12 months, and '0' otherwise. Note that the survey does not ask respondents what relationship, if any, they had with the person responsible for the assault.

¹ The basic idea is that each individual serves as their own control. As our conclusions are based solely on the association between alcohol use and violence within an individual, unmeasured differences between individuals cannot bias the outcome. A more detailed description of fixed effect panel designs can be found in Mehmetoglu and Jokobsen (2017).

Principal independent variable

The question of how to measure alcohol use is central to our study. HILDA asks two questions relevant to alcohol use. The first asks respondents *How often do you drink alcohol?* The response options for this question are *I have never drunk alcohol, I no longer drink, I drink very rarely, less than once a week, 1 or 2 days a week, 3 or 4 days a week, 5 or 6 days a week and every day.* The second asks respondents: *On a day that you have an alcoholic drink, how many standard drinks do you usually have?* The response options to this question are: *1 to 2 standard drinks, 3 to 4 standard drinks, 5 to 6 standard drinks, 7 to 8 standard drinks, 9 to 10 standard drinks, 11 to 12 standard drinks, and 13 or more standard drinks.*

The National Guidelines on risky drinking (NHMRC, 2025) are based on both frequency of drinking and amount of alcohol consumed. Those guidelines, however, are geared toward the alcohol consumer's health, not the risk of becoming a victim of violence. In preliminary investigation, we found the bi-variate association between violent victimization and frequency of alcohol use (Cramer's $V = 0.0147$; Kendall's tau = 0.002) was much weaker than the bi-variate association between violent victimization and drinking amount (Cramer's $V = 0.0926$; Kendall's tau = 0.0396). If, as some maintain Exum (2006), alcohol facilitates aggression in part because it acts as a disinhibitor, we would expect the quantity of alcohol consumed at any one time to be more intricately linked to the level of intoxication rather than the frequency with which alcohol is consumed. In this study, therefore, we use the number of standard drinks consumed at a sitting as our measure of alcohol use rather than the frequency of alcohol use (or some combination of frequency and quantity).

Controls

The controls in our analysis include the number of financial stressors, the number of personal stressors,² social isolation, marital status, age in years (categorized as 15–24, 25–54, 55–64 and 65+ in the year of the interview) education, socioeconomic disadvantage, whether the respondent has experienced pregnancy and alcohol consumption. All these factors have been identified as actual correlates of violence against women (see, for example, Mouzos & Makkai, 2004; Smith & Weatherburn, 2013; Stavrou et al., 2016; Yakubovich et al., 2018). In addition to these factors, we include the survey year. As a defense against any general tendency for violence against women to increase or decrease.

The number of financial stressors was obtained from a list of seven presented to respondents, who were asked which of them had occurred since January in the preceding 12 months. The financial stressors are *could not pay electricity, gas, or telephone bills on time, could not pay the mortgage, or rent on time, pawned or sold something, went without meals, was unable to heat home, asked for financial help from friends or family, and asked for help from welfare/community organizations.* The mean, median and range of financial stressors were 0.31, 0 and 4, respectively. The number of financial stressors was categorized as '0', '1', '2,' or '3 or more.'

The nine personal stressors were obtained from the section of the self-completion questionnaire which asks respondents whether they have experienced any of a range of events over the past 12 months and how long ago each event took place. The items are *serious personal injury or illness of a close relative/family member death of spouse or child, death of other close relative/family member (e.g., parent or sibling), death of a close friend, retired from the workforce, fired or made redundant by an employer,*

² This variable constructed by summing positive responses to HILDA questions about whether in the last 12 months the respondent has experienced either a serious personal injury/illness, death of a close relative or family member, death of a close friend retirement from the workforce, being fired or made redundant, having changed jobs, a major worsening of finances or a change in residence.

changed jobs (i.e., employers), major worsening in financial situation (e.g., went bankrupt) and changed residence. The median and range of personal stressor scores were 0.69, 0 and 5, respectively. The number of personal stressors was categorized as '0', '1', '2', '3', '4 or more'.

The social network mean score is based on HILDA's social network index. Although it is described as a measure of the size of an individual's social network, the individual items used are readily interpreted as measures of social support. There are five positively phrased items (*I seem to have a lot of friends; there is someone who can always cheer me up when I'm down; I enjoy the time I spend with the people who are important to me; when something's on my mind, just talking with the people I know can make me feel better; when I need someone to help me out, I can usually find someone*) and five negatively charged items (*people don't come to visit me as often as I would like; I often need help from other people but can't get it; I don't have anyone that I can confide in; I have no one to lean on in times of trouble; I often feel very lonely*). Response options are on a scale from 1 (strongly agree) to 7 (strongly disagree). Positive items were reverse coded, so that higher mean scores indicate less social support. For this reason, we refer to the variable as a measure of social isolation. The mean, median, and range of social isolation scores were: 2.49, 2.3 and 6, respectively. Mean item scores were categorized either '1.00–1.99', '2.00–2.99', '3.00–3.99' or '4.00 or higher'. As no period was specified, we assume that responses reflect how respondents felt at the time of the survey.

Analysis

As noted earlier, we conduct three sets of analyses for each outcome of interest (i.e., six analyses in total). We begin by pooling all survey waves and examining the cross-sectional relationship between quantity of alcohol consumed and physical violence to confirm the relationship found in previous cross-sectional analyses. We then look at the relationship between the quantity of alcohol consumed in wave t and the risk of physical violence in wave $t + 1$ to check for any lagged effects. Since the data are not independent, we employ a generalized estimation equation (GEE) logistic regression model with an exchangeable correlation matrix and robust standard errors to analyze the data in the cross-sectional and lagged analyses. This is done using the `xtgee` command³ in Stata. The third analysis is the fixed effect panel analysis.

In the second set of analyses, the effects of being a victim of physical violence on alcohol use become the focus of attention. Three further sets of analyses are conducted, mirroring the cross-sectional, lagged, and fixed effect analyses where physical violence was the focus of attention. However, because the outcome in this group of analyses is a count (number of standard drinks consumed), we employ a generalized estimation equation (GEE) negative binomial regression model rather than a (GEE) logistic regression model.

Results

Descriptive statistics

Table 1 provides descriptive statistics for the variables included in the analysis.

All variable values are well represented in terms of sample size. Some variables have missing values, but the percentage of missing values is under three per cent for all variables and under two per cent for all but

³ The `xtgee` command fits a population-averaged generalized linear model to the data and allows the user to specify the error covariance structure. Preliminary tests using three different correlation structures (independent, exchangeable, unstructured) and two different methods for estimating standard errors (robust, bootstrap) made very little difference to the estimated effect of alcohol consumption on assault, so in what follows we focus on the model which uses an exchangeable correlation structure and robust standard errors.

Table 1
Sample description.

| Variable | Freq. | Percent | Missing (N) | Missing (%) |
|--------------------------|---------|---------|-------------|-------------|
| Age group | | | 0 | 0.00 |
| 15–24 | 24,223 | 16.41 | | |
| 25–54 | 75,079 | 50.86 | | |
| 55–64 | 21,381 | 14.48 | | |
| 65 and above | 26,937 | 18.25 | | |
| School completion | | | 79 | 0.05 |
| completed year 11 or 12 | 93,649 | 63.52 | | |
| completed year 10 | 35,767 | 24.26 | | |
| less than year 10 | 18,012 | 12.22 | | |
| Disadvantage | | | 42 | 0.03 |
| not very disadvantaged | 118,115 | 80.04 | | |
| very disadvantaged | 29,463 | 19.96 | | |
| Financial stressors | | | 4233 | 2.99 |
| None | 120,446 | 81.59 | | |
| 1 | 14,834 | 10.05 | | |
| 2 | 6499 | 4.4 | | |
| 3+ | 5841 | 3.96 | | |
| Personal stressors | | | 1961 | 1.33 |
| None | 76,828 | 52.04 | | |
| 1 | 46,918 | 31.78 | | |
| 2 | 18,202 | 12.33 | | |
| 3 | 4502 | 3.05 | | |
| 4+ | 1170 | 0.79 | | |
| Variable | Freq. | Percent | Missing (N) | Missing (%) |
| Social isolation | | | 1347 | 0.91 |
| 1.00–1.99 | 51,177 | 34.67 | | |
| 2.00–2.99 | 48,586 | 32.91 | | |
| 3.00–3.99 | 28,493 | 19.3 | | |
| 4 and above | 19,364 | 13.12 | | |
| Ever married/de facto | | | 0 | 0.00 |
| No | 63,062 | 42.72 | | |
| Yes | 84,558 | 57.28 | | |
| Pregnant | | | | |
| No | 137,477 | 94.31 | | |
| Yes | 8299 | 5.69 | | |
| Drink amount | | | 1982 | 1.34 |
| doesn't drink | 31,939 | 21.93 | | |
| 1 to 2 standard drinks | 72,196 | 49.57 | | |
| 3 to 4 standard drinks | 25,592 | 17.57 | | |
| 5 to 6 standard drinks | 9288 | 6.38 | | |
| 7 to 8 standard drinks | 3567 | 2.45 | | |
| 9 to 10 standard drinks | 1678 | 1.15 | | |
| 11 to 12 standard drinks | 653 | 0.45 | | |
| 13+ standard drinks | 725 | 0.5 | | |
| Physical violence victim | | | 2048 | 1.38 |
| No | 143,244 | 98.4 | | |
| Yes | 2328 | 1.6 | | |

one (financial stressors). There are a few noteworthy features of the sample. Most have no financial or social stressors, and most are not socially isolated. The majority drink one or two standard drinks when they consume alcohol, however a small proportion report consuming thirteen or more standard drinks at a sitting. The percentage of women reporting having been a victim of physical violence in the preceding 12 months (1.38 %) is a little lower than the Australian Bureau of Statistics crime victim survey estimate in 2023/24 (1.6 %), but not markedly so (ABS, 2023–24).

Multivariable analyses with physical violence as the dependent variable

Table 2 shows the results of the first three sets of analyses (i.e., where physical violence is the outcome). The first panel in Table 3 shows the cross-sectional GEE results and is based on 145,517 observations drawn from 15,934 individuals. The second panel shows the results of the lagged GEE analysis where we examine the effect of alcohol use in wave t on physical violence in wave t + 1. This analysis is based on 120,607 observations drawn from 13,111 individuals. The third panel shows the results of the fixed effect panel analysis and involves 14,928 observations drawn from 1250 individuals.

The cross-sectional results (first panel) show significant relationships between all covariates and the likelihood of a woman having experienced physical violence in the past 12 months. The odds of physical violence are higher for women who are less well educated or disadvantaged, who experience financial stress, personal stress, or social isolation, or who are pregnant. They are lower for women who are older, who have been married or lived in a de facto relationship, and who do not drink alcohol or who only drink it in moderation. The odds of experiencing physical violence rise rapidly for women who usually drink more than 3 or 4 standard drinks at a sitting. At 5 to 6 standard drinks at a sitting, the odds of physical violence are 1.33 times higher than for a non-drinker (CI: 1.121–1.579), increasing to 1.47 for a woman who consumes 7 to 8 standard drinks (CI: 1.180–1.828), 1.76 for a woman who consumes 9 to 10 standard drinks (CI: 1.362–2.280), 1.9 for a woman who consumes 11–12 standard drinks (CI: 1.314–2.744), and 3.1 for a woman who consumes 13 or more standard drinks (2.269–4.260).

The middle panel shows the association between the quantity of alcohol consumed at a given sitting in wave t and physical violence as measured at wave t + 1. As before, women in the lagged analysis are more likely to report having been assaulted in the next 12 months if they are less well educated or disadvantaged, if they experience financial stress, personal stress, or social isolation, if they report being pregnant, or if they consume larger amounts of alcohol at a sitting. They are lower for women who are older or who report having been married or lived in a de facto relationship. Close inspection of the odds ratios reveals that the effects of our covariates in the lagged analysis are more attenuated than they were in the cross-sectional analysis.

The final panel shows the results of the fixed effect panel analysis. Recall that in this analysis, the results are based solely on the intra-individual variation in physical violence and alcohol consumption. Age, for this reason, has not been included in the analysis because all respondents age at the same rate. Most covariates included in the analysis preserve the same sign and significance as in the cross-sectional and lagged analyses. There are two exceptions. Being disadvantaged and being pregnant are no longer significantly associated with the risk of being assaulted. The effects of alcohol consumption mirror those observed in the cross-sectional analysis. Consuming one to two standard drinks at a sitting has no effect on the risk of assault. Consuming more than this, rapidly increases the odds. The odds ratios associated with 11 to 12, or 30 or more standard drinks for example, are 1.686 (CI: 1.082–2.628) and 2.327 (CI: 1.562–3.468), respectively. Expressed in terms of risks of physical violence victimization and controlling for other factors, the risk of physical violence is nine per cent for a woman who consumes 1–2 standard drinks at a sitting, 15 per cent for a woman who consumes 7 to 8 standard drinks at a sitting and 20 per cent for a woman who normally consumes 13 or more standard drinks at a sitting.

Multivariable analyses with alcohol consumption as the dependent variable

Table 3 shows the results of the three sets of analyses where alcohol consumption is the dependent variable.

As before, panel 1 shows the results of a cross-sectional analysis, panel 2 shows the lagged relationship between covariates (including a previous assault) at wave t and alcohol use at wave t + 1, and panel 3 shows the results of the fixed effect panel analysis. The cross-sectional analysis is based on 145,517 observations drawn from 15,517 respondents. The lagged GEE analysis is based on 121,410 observations drawn from 13,152 respondents. The fixed effect analysis is based on 60,205 observations drawn from 5293 respondents. Because we use negative binomial regression to model the factors influencing alcohol consumption, the effects of our covariates are expressed in terms of incident rate ratios rather than odds ratios.

In the cross-sectional analysis the incident rate ratios for disadvantage, financial stress, personal stress and experiencing and physical violence in the previous 12 months are all larger than one and significant, but not especially large. Similarly small effects can be seen for

Table 2
Logistic regression models of the effect of alcohol consumption by women on violence against women.

| Victim of physical violence | Cross sectional | | | | Lagged | | | | Fixed effect | | | |
|---|-----------------|-------|---------------|---------------|------------|-------|---------------|---------------|--------------|-------|---------------|---------------|
| | Odds Ratio | P> z | Lower 95 % CI | Upper 95 % CI | Odds Ratio | P> z | Lower 95 % CI | Upper 95 % CI | Odds Ratio | P> z | Lower 95 % CI | Upper 95 % CI |
| Age group (ref) | | | | | | | | | | | | |
| 15–24 (ref) | | | | | | | | | | | | |
| 25–54 | 0.812 | 0.001 | 0.717 | 0.921 | 0.795 | 0.005 | 0.676 | 0.934 | — | — | — | — |
| 55–64 | 0.343 | 0.000 | 0.270 | 0.437 | 0.326 | 0.000 | 0.245 | 0.434 | — | — | — | — |
| 65 and above | 0.207 | 0.000 | 0.158 | 0.273 | 0.181 | 0.000 | 0.132 | 0.248 | — | — | — | — |
| School completion completed year 12 (ref) | | | | | | | | | | | | |
| completed year 10 | 1.390 | 0.000 | 1.207 | 1.601 | 1.399 | 0.000 | 1.184 | 1.652 | 1.134 | 0.521 | 0.772 | 1.664 |
| less than year 10 | 1.597 | 0.000 | 1.318 | 1.935 | 1.731 | 0.000 | 1.379 | 2.173 | 1.574 | 0.160 | 0.836 | 2.962 |
| Highly disadvantaged | 1.143 | 0.029 | 1.014 | 1.289 | 1.147 | 0.076 | 0.986 | 1.333 | 0.915 | 0.307 | 0.771 | 1.086 |
| Financial stressors | | | | | | | | | | | | |
| None (ref) | | | | | | | | | | | | |
| 1 | 1.621 | 0.000 | 1.419 | 1.852 | 1.390 | 0.000 | 1.174 | 1.646 | 1.328 | 0.001 | 1.128 | 1.564 |
| 2 | 2.518 | 0.000 | 2.161 | 2.934 | 2.134 | 0.000 | 1.744 | 2.611 | 1.764 | 0.000 | 1.470 | 2.116 |
| 3+ | 4.127 | 0.000 | 3.566 | 4.776 | 3.448 | 0.000 | 2.860 | 4.155 | 2.284 | 0.000 | 1.907 | 2.734 |
| | Cross sectional | | | | Lagged | | | | Fixed effect | | | |
| Victim of physical violence | Odds Ratio | P> z | Lower 95 % CI | Upper 95 % CI | Odds Ratio | P> z | Lower 95 % CI | Upper 95 % CI | Odds Ratio | P> z | Lower 95 % CI | Upper 95 % CI |
| Personal stressors | | | | | | | | | | | | |
| 0 (ref) | | | | | | | | | | | | |
| 1 | 1.778 | 0.000 | 1.588 | 1.991 | 1.468 | 0.000 | 1.302 | 1.656 | 1.634 | 0.000 | 1.427 | 1.871 |
| 2 | 2.472 | 0.000 | 2.170 | 2.816 | 1.645 | 0.000 | 1.410 | 1.919 | 2.102 | 0.000 | 1.802 | 2.452 |
| 3 | 3.457 | 0.000 | 2.890 | 4.136 | 1.954 | 0.000 | 1.534 | 2.489 | 2.637 | 0.000 | 2.139 | 3.250 |
| 4+ | 7.610 | 0.000 | 6.069 | 9.542 | 3.651 | 0.000 | 2.650 | 5.030 | 4.905 | 0.000 | 3.755 | 6.407 |
| Social isolation score | | | | | | | | | | | | |
| 0–1.99 (ref) | | | | | | | | | | | | |
| 2.00–2.99 | 1.387 | 0.000 | 1.206 | 1.595 | 1.337 | 0.000 | 1.146 | 1.559 | 1.199 | 0.039 | 1.009 | 1.425 |
| 3.00–3.99 | 1.970 | 0.000 | 1.697 | 2.287 | 1.792 | 0.000 | 1.513 | 2.122 | 1.493 | 0.000 | 1.231 | 1.811 |
| 4 + | 2.629 | 0.000 | 2.255 | 3.065 | 2.374 | 0.000 | 1.987 | 2.836 | 1.651 | 0.000 | 1.345 | 2.027 |
| Ever married/de facto | 0.467 | 0.000 | 0.411 | 0.530 | 0.623 | 0.000 | 0.534 | 0.727 | 0.492 | 0.000 | 0.418 | 0.580 |
| Pregnant | 1.370 | 0.001 | 1.141 | 1.644 | 1.393 | 0.002 | 1.127 | 1.723 | 0.883 | 0.240 | 0.718 | 1.087 |
| Drink amount | | | | | | | | | | | | |
| Does not drink (ref) | | | | | | | | | | | | |
| 1 to 2 standard drinks | 0.889 | 0.091 | 0.775 | 1.019 | 0.760 | 0.001 | 0.647 | 0.892 | 1.079 | 0.422 | 0.896 | 1.300 |
| 3 to 4 standard drinks | 0.995 | 0.948 | 0.851 | 1.163 | 0.839 | 0.079 | 0.689 | 1.021 | 1.057 | 0.597 | 0.860 | 1.299 |
| 5 to 6 standard drinks | 1.331 | 0.001 | 1.121 | 1.579 | 1.311 | 0.010 | 1.067 | 1.611 | 1.288 | 0.033 | 1.021 | 1.624 |
| 7 to 8 standard drinks | 1.468 | 0.001 | 1.180 | 1.828 | 1.159 | 0.302 | 0.875 | 1.536 | 1.515 | 0.005 | 1.132 | 2.027 |
| 9 to 10 standard drinks | 1.762 | 0.000 | 1.362 | 2.280 | 1.548 | 0.009 | 1.117 | 2.145 | 1.738 | 0.002 | 1.231 | 2.454 |
| 11 to 12 standard drinks | 1.899 | 0.001 | 1.314 | 2.744 | 1.718 | 0.035 | 1.039 | 2.841 | 1.686 | 0.021 | 1.082 | 2.628 |
| 13+ standard drinks | 3.109 | 0.000 | 2.269 | 4.260 | 2.428 | 0.000 | 1.590 | 3.708 | 2.327 | 0.000 | 1.562 | 3.468 |

women facing one or two personal stressors. There is no effect of social isolation. Women who did not complete year 11 or 12 are less likely to consume more alcohol at a sitting than women who completed these years of schooling. The incident rate ratios for age, having been married/de facto and being pregnant are all significant and less than one, indicating that these factors are all associated with lower levels of alcohol consumption at a given sitting. Being assaulted does appear to increase the amount of alcohol consumed. The incident rate ratio of (1.18, CI: 1.110–1.254) indicates that women who report having been assaulted in the previous 12 months consume approximately 18 per cent more standard drinks at any given sitting than those who report they have not been assaulted in the preceding 12 months.

The lagged analysis results broadly mirror those in the cross-sectional analysis in relation to age, education, financial stress, personal stress, social isolation, marital status, and pregnancy. However,

being disadvantaged and being a victim of physical violence in one year are not significantly related to the risk of physical violence in the following year. The results from the fixed effect panel analysis generally match those in the cross-sectional analysis in relation to education, personal stress and social isolation and alcohol use. Those who are disadvantaged, however, are significantly less likely to consume more alcohol. Moreover, having been or currently being married or in a de-facto relationship increases alcohol consumption. The effects of alcohol use on the risk of physical violence are quite strong. A woman who reports having been assaulted typically consumes an average of 13 per cent more alcohol per sitting than a woman who has not been assaulted, a result consistent with but slightly lower than that recorded in the cross-sectional analysis.

Table 3
Negative binomial models of the effect of violence on alcohol consumption by women.

| Drink amount | Cross sectional | | | | Lagged | | | | Fixed effect | | | |
|--------------------------------|-----------------|-------|---------------|---------------|--------|-------|---------------|---------------|--------------|-------|---------------|---------------|
| | IRR | P> z | Lower 95 % CI | Upper 95 % CI | IRR | P> z | Lower 95 % CI | Upper 95 % CI | Odds Ratio | P> z | Lower 95 % CI | Upper 95 % CI |
| Age group | | | | | | | | | | | | |
| 15–24 (ref) | | | | | | | | | | | | |
| 25–54 | 0.816 | 0.000 | 0.791 | 0.841 | 0.748 | 0.000 | 0.718 | 0.780 | — | — | — | — |
| 55–64 | 0.768 | 0.000 | 0.738 | 0.799 | 0.707 | 0.000 | 0.677 | 0.738 | — | — | — | — |
| 65 and above | 0.692 | 0.000 | 0.662 | 0.724 | 0.635 | 0.000 | 0.606 | 0.665 | — | — | — | — |
| completed year 12 (ref) | | | | | | | | | | | | |
| completed year 10 | 0.603 | 0.000 | 0.581 | 0.627 | 0.626 | 0.000 | 0.602 | 0.652 | 0.042 | 0.000 | 0.036 | 0.050 |
| less than year 10 | 0.536 | 0.000 | 0.510 | 0.563 | 0.550 | 0.000 | 0.521 | 0.581 | 0.016 | 0.000 | 0.012 | 0.022 |
| Highly disadvantaged | 1.032 | 0.013 | 1.007 | 1.058 | 1.011 | 0.447 | 0.983 | 1.040 | 0.889 | 0.011 | 0.811 | 0.974 |
| Financial stressors | | | | | | | | | | | | |
| None (ref) | | | | | | | | | | | | |
| 1 | 1.079 | 0.000 | 1.054 | 1.104 | 1.031 | 0.001 | 1.012 | 1.050 | 1.158 | 0.000 | 1.070 | 1.252 |
| 2 | 1.096 | 0.000 | 1.059 | 1.135 | 1.041 | 0.013 | 1.008 | 1.074 | 1.074 | 0.208 | 0.961 | 1.200 |
| 3+ | 1.127 | 0.000 | 1.082 | 1.174 | 1.066 | 0.007 | 1.018 | 1.117 | 0.951 | 0.420 | 0.841 | 1.075 |
| Drink amount | | | | | | | | | | | | |
| Personal stressors | | | | | | | | | | | | |
| 0 (ref) | | | | | | | | | | | | |
| 1 | 1.035 | 0.000 | 1.021 | 1.049 | 1.014 | 0.002 | 1.005 | 1.023 | 1.150 | 0.000 | 1.093 | 1.210 |
| 2 | 1.068 | 0.000 | 1.047 | 1.090 | 1.032 | 0.000 | 1.017 | 1.047 | 1.263 | 0.000 | 1.174 | 1.360 |
| 3 | 1.109 | 0.000 | 1.066 | 1.154 | 0.995 | 0.734 | 0.965 | 1.025 | 1.398 | 0.000 | 1.219 | 1.603 |
| 4+ | 1.159 | 0.000 | 1.069 | 1.257 | 1.100 | 0.009 | 1.024 | 1.181 | 1.465 | 0.003 | 1.137 | 1.887 |
| Social isolation score | | | | | | | | | | | | |
| 0–1.99 (ref) | | | | | | | | | | | | |
| 2.00–2.99 | 1.003 | 0.720 | 0.986 | 1.020 | 1.007 | 0.259 | 0.995 | 1.018 | 1.042 | 0.213 | 0.976 | 1.113 |
| 3.00–3.99 | 0.999 | 0.960 | 0.979 | 1.021 | 1.012 | 0.157 | 0.995 | 1.029 | 1.055 | 0.198 | 0.973 | 1.143 |
| 4 + | 1.005 | 0.692 | 0.981 | 1.030 | 1.000 | 0.993 | 0.981 | 1.020 | 0.994 | 0.893 | 0.907 | 1.089 |
| Victim of physical violence | 1.180 | 0.000 | 1.110 | 1.254 | 1.052 | 0.137 | 0.984 | 1.125 | 1.209 | 0.030 | 1.019 | 1.436 |
| Ever married/de facto | 0.970 | 0.006 | 0.949 | 0.991 | 0.940 | 0.000 | 0.916 | 0.964 | 1.437 | 0.000 | 1.322 | 1.562 |
| Pregnant | 0.645 | 0.000 | 0.630 | 0.662 | 0.841 | 0.000 | 0.816 | 0.866 | 0.139 | 0.000 | 0.127 | 0.152 |

Discussion

The aim of this paper was to examine two issues of importance to public health policy. The first concerns the impact of alcohol consumption by women on the risk of experiencing an assault. The second concerns the impact of violence on alcohol consumption by women. We find evidence that women who consume large amounts of alcohol are at higher risk of being assaulted. We also find strong evidence that being assaulted increases the amount of alcohol consumed in a single sitting.

Our findings on alcohol and violence differ from those obtained by Smith and Weatherburn (2013). In their fixed effect analysis, they found no effect of alcohol use by a woman on her risk of being assaulted. There are two likely reasons for the discrepancy. The first is that their measure of alcohol use was based on the 2001 National Health and Medical Research Council Australian alcohol guidelines, which combine measures of drinking amount and drinking frequency. As we noted in the method section, the quantity of alcohol consumed in a sitting is much more closely related to intoxication and the risk of experiencing an assault, than the number of days per week or month on which a person drinks. Another possible explanation for their non-significant results is that they had a much smaller follow-up period than ours (six annual interviews, compared with our 22). Since the fixed effect analysis requires considerable within subject variation in outcomes, this may have blunted the capacity of the Smith and Weatherburn (2013) study to detect an effect of alcohol consumption on assault.

Several explanations have been put forward to explain the effect of alcohol use by a woman on her risk of becoming a victim of assault. According to the expectancy hypothesis, alcohol increases aggression for no other reason than that people expect it to (Quigley & Leonard, 2006).

There is little experimental support for this view (Watkins et al., 2023). It is also possible that women drink heavily in the expectation of future violence. According to the disinhibition hypothesis, alcohol lowers the threshold for aggressive or hostile behaviour. There is evidence that alcohol may disinhibit aggression among people who have experienced adverse childhood experiences (e.g., abuse, neglect, exposure to domestic violence) (Bellis et al., 2018). The finding that becoming a victim of violence increases the risk of increased alcohol consumption is also consistent with both epidemiological and experimental evidence that people exposed to stress or trauma often turn to alcohol or other drugs to cope with that experience (Ogden et al., 2022; Smith & Cottler, 2018). The effect of alcohol on violence may also be mediated or moderated by factors such as provocation, frustration, attitudes to violence and concerns about retaliation (Exum, 2006).

One explanation not previously put forward, but worthy of consideration, is that is that the violence often experienced by women who drink large amounts of alcohol may occur because they often do so in the company of a male who is also drinking large amounts of alcohol and that it is his drinking rather than her drinking which puts her at risk of being assaulted. Alternatively, heavy or binge drinking sessions involving people known to each other may result in both parties becoming more aggressive, provocative, or hostile, which ultimately spills over into violence. Exum’s (2006) review is highly relevant here, because it is clearly not the case that all heavy drinking sessions involving people known to or acquainted with each other end in a violent altercation. As she argues, much would seem to depend on attitudes toward and personal experiences of violence. Moylan et al. (2010), for example, in a longitudinal study involving children in Pennsylvania, for example, found that children who were abused by their parents or who

witnessed violence between their parents were more likely to engage in violent or aggressive behaviour once they reached adolescence. Our control variables are also worthy of comment in this connection. It is often said that women are more likely to be assaulted when they are pregnant (see, for example, [Alhusen et al., 2015](#)). We found pregnancy to be a risk factor for physical violence in our cross-sectional and lagged effect analyses. In the fixed effect analysis, however, the relationship between pregnancy and risk of becoming a victim of physical violence was not significant. This suggests that the association between pregnancy and violence may be due to confounding with some other factor or factors not included in the cross-sectional and lagged regression analyses. Another point worthy of note is the strength of the association between the risk of being assaulted and the level of financial stress, personal stress, and social isolation. These findings underscore the importance of addressing the socioeconomic and psychological underpinnings of violence against women.

Although we have addressed some of the limitations of earlier studies on the relationship between alcohol use and violence against women, the present study is not without its own limitations. Firstly, if there is a simultaneous relationship between drinking and violence, our estimates of the effect of drinking on violence may be biased. The only way to resolve this issue is to find a variable that influences alcohol consumption but does not affect the risk of physical violence other than through its effect on alcohol use and then conduct an instrumental variable (IV) analysis ([Mehmetoglu & Jakobsen, 2017](#)). Although IV methods have been used to examine the relationship between alcohol consumption and violence ([Averett & Wang, 2016](#)), the choice of instruments has been somewhat controversial ([French & Popovici, 2011](#)) and none have been published which look at the relationship between drinking by women and their risk of being assaulted. The second limitation is that we know nothing about the relationship between the person responsible for the violence reported by women in HILDA, or the circumstances in which alcohol consumption takes place (e.g., Were one or both parties consuming alcohol together or was only one person drinking?). Finally, it is important to remember that physical violence is only one manifestation of violence against women. Other forms include coercion, verbal abuse, and sexual violence. The HILDA survey does not capture these forms of violence.

Notwithstanding these limitations, the current findings have important implications for prevention policy and future research. Our results underscore the point made by [Coumarelos and Allen \(1998\)](#) that the risk of violence against a woman can vary considerably, depending on her alcohol use, the level of personal and financial stress she is under and whether she is socially isolated. Prevention resources are always limited and are therefore best targeted at those who are most at risk, regardless of whether the correlate plays a causal role or is simply a signal of heightened risk. Moreover, although the current study cannot be said to have resolved the relationship between alcohol consumption and violence against women, it would be prudent to ensure that women reporting domestic physical violence to health, welfare of criminal justice authorities, are assessed to determine whether they also have concurrent drug and alcohol problems and, if so, to ensure they are provided with an appropriate treatment referral. Finally, it is hard to see how further progress in understanding the relationship between alcohol and violence against women can be made without information on both the victim and offender. Future research should seek to remedy this gap.

CRedit authorship contribution statement

Don Weatherburn: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Sara Rahman:** Writing – review & editing, Formal analysis, Data curation. **Joanna Wang:** Writing – review & editing, Validation, Methodology.

Declaration of competing interest

The authors declare they have no financial or personal relationships with other people or organisations that could inappropriately influence or bias this work. This includes employment, consultancies, stock ownership, honoraria, paid expert testimony, patent applications or registrations and grants or other funding.

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Declaration of generative AI in scientific writing

The authors declare that they made no use of AI in drafting the paper and no use of AI in analyzing the data on which the research is based.

Data and code access

The data used in this study can be obtained by contacting the Melbourne Institute at hilda-inquiries@unimelb.edu.au or by calling +61 3 8344 2100. The STATA code used in this analysis can be obtained by contacting the first author at d.weatherburn@unsw.edu.au

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