



## **Supporting Information**

### **Supplementary methods and results**

**This appendix was part of the submitted manuscript and has been peer reviewed.  
It is posted as supplied by the authors.**

Appendix to: Grigg J, Manning M, Lockie D, et al. A brief intervention for improving alcohol literacy and reducing harmful alcohol use by women attending a breast screening service: a randomised controlled trial. *Med J Aust* 2023; doi: 10.5694/mja2.51991.

## Supplementary methods

### 1. Take-home pamphlet summarising the Health4Her brief alcohol intervention content, provided to women in the active trial arm

#### THE LESS YOU CHOOSE TO DRINK, THE GREATER THE HEALTH BENEFITS



- Improved mood & well-being
- Better memory & concentration
- Better sleep quality
- More energy



- Improved complexion
- Less noticeable fine lines & wrinkles
- Slimmer waistline



- Reduced risk of breast cancer
- Stronger immune system
- Improved teeth, gum & mouth health
- Less bloating & digestive issues
- Improved heart health & circulation

#### TIPS FOR DRINKING LESS TO IMPROVE YOUR HEALTH

*Every improvement you make counts*



**Keep track of your intake**  
Check the label of any bottle or can for the number of standard drinks



**Plan ahead & set limits**  
Make a plan the week and choose your alcohol-free days for the week ahead



**Take a break**  
Challenge yourself by taking part in an event like Dry July



**Make the switch**  
Keep your pantry stocked with your favourite non-alcoholic drinks



**Change it up**  
Opt for coffee or a walk instead when catching up with friends

#### MAKE A PLAN FOR CHANGE

Identifying what is important can be great motivation to help you reduce your drinking. These questions can help you think about what is important to you.

##### What do I want to change about my drinking?

e.g. drink less often, or limit the number of drinks I have

##### What worries me about my drinking?

e.g. increases my risk of breast cancer, other health risks

##### What are the best reasons for changing my drinking?

e.g. I'll sleep better, I'll have more energy, I'll feel better

#### FOR SUPPORT & MORE INFORMATION

##### DirectLine

Call 1800 888 236 or visit [directline.org.au](http://directline.org.au) for alcohol & drug information, counselling and referral. Confidential, free and available 24/7.

##### Counselling Online

Visit [counsellingonline.org.au](http://counsellingonline.org.au) for alcohol & drug support and counselling. Confidential, free and available 24/7.

health4her

# health4her

health4her aims to provide  
the latest health information  
to women attending  
breast screening services



Supported by



WE'VE ALL HEARD that there are some breast cancer risk factors we cannot change, like family history and genetics.

However, we can change our lifestyle choices, and there is now strong evidence showing that even small lifestyle changes can reduce your risk of breast cancer, and improve your overall health.

## ALCOHOL & BREAST CANCER RISK

Alcohol is a carcinogen, meaning that its consumption can cause cancer in humans. There's now strong evidence that drinking alcohol increases your risk of breast cancer.



- Carcinogens:
- Alcohol
  - Smoking
  - Asbestos
  - Solar radiation (from the sun)

**Latest Australian Alcohol Guidelines**

Healthy women should drink no more than **10 standard drinks per week** (and no more than 4 standard drinks on any one day)

While the latest guidelines recommend healthy women drink no more than 10 standard drinks per week, for some women, not drinking at all is the safest option.

**The less you choose to drink, the lower your risk of alcohol-related harm**

## WHAT IS A STANDARD DRINK?

In Australia, a *standard drink* refers to 10 grams of alcohol.

It's important to know that a *serve* of alcohol often contains more than one standard drink. For example, the average restaurant serve of red wine contains approximately 1.6 standard drinks.



### 1.6 standard drinks

Average restaurant serve of red wine



### 1.4 standard drinks

Average restaurant serve of white or sparkling wine



### 1.4 standard drinks

Full strength bottle / can of beer or cider



### 1 standard drink

30ml shot / nip of a spirit

## IT'S NOT JUST WOMEN DRINKING EXTREME AMOUNTS WHO ARE AT RISK...

New research has confirmed that drinking more than 1.3 standard drinks per day (which is less than an average restaurant serve of wine per day) increases risk of breast cancer by 23%.

Your risk of breast cancer continues to increase significantly with the more alcohol you drink.

For women who have been treated for breast cancer

More than **half** a standard drink per day increases risk of breast cancer recurrence

**Alcohol consumption has also been linked to over 200+ chronic diseases and health conditions.**

The following are just some of the health conditions linked to alcohol consumption:

- Breast cancer
- High blood pressure
- Stroke
- Loss in bone mineral density
- Memory problems

And, if you're taking prescription medicines, drinking alcohol can reduce their effectiveness, and increase negative side-effects.

**The less you choose to drink, the lower your risk of alcohol-related harm - even small changes can benefit your health.**

## **2. Personalised feedback and comparison with gender-/age-related drinking norms, received by women in the active trial arm**

For participants allocated to the Health4Her intervention, responses to screening questions determined current alcohol use classification (exceeding or not exceeding Australian alcohol guidelines) and the version of the brief alcohol intervention received.

The following personalised feedback and comparison to gender-/age-related drinking benchmarks was received by participants allocated to the Health4Her intervention whose alcohol consumption exceeded national guidelines:

*“You indicated that you are drinking above the recommended limit of 10 standard drinks per week. Eight out of 10 Australian women your age are drinking less alcohol than you. The amount you are drinking is putting your health at risk.”*

The following personalised feedback and comparison with gender-/age-related drinking benchmarks was received by participants allocated to the Health4Her intervention whose alcohol consumption did not exceed national guidelines:

*“You indicated that you are drinking within the recommended amount of 0 to 10 standard drinks per week. You’re doing a good thing for your health – the less you choose to drink, the lower your risk of alcohol-related harm.”*

### 3. Details of secondary and pre-specified exploratory outcomes, and literacy items

Secondary outcomes were change in the proportion of participants who accurately identified i) the amount of alcohol in an Australian standard drink, ii) the number of standard drinks in an average restaurant serve of red wine, and iii) the maximum number of standard drinks per week recommended by current Australian Alcohol Guidelines (1, 2) at week 4, assessed with multiple choice and free text response items.

Other secondary outcomes were change in i) the proportion of participants drinking >10 standard drinks per week, ii) the proportion of participants drinking >4 standard drinks on a single day (corresponding to then current Australian alcohol guidelines, which recommended healthy adults drink no more than 10 standard drinks per week, and no more than four standard drinks on any one day), and iii) past fortnight drinking patterns (drinking days, days >2 standard drinks consumed, days >4 standard drinks consumed [heavy drinking days], total standard drinks) at weeks 4 and 12, assessed by timeline follow-back (3).

Pre-specified exploratory outcomes were i) change in the proportion of participants who accurately identified alcohol as a risk factor for breast cancer (free text response item), and ii) change in the proportion of participants who accurately identified inactivity and excess weight as clear risk factors for breast cancer (scaled response items) (4, 5) at week 4. Alcohol and breast cancer literacy items are presented below.

To what extent do you consider the following factors to be associated with an increased risk of breast cancer?

*Clear risk factor:* there is strong, consistent evidence that this factor increases the risk of breast cancer.  
*Possible risk factor:* there is some evidence that this factor increases the risk of breast cancer, but not enough to be certain.  
*Not a proven risk factor:* the evidence is too limited to determine whether this factor increases the risk of breast cancer.

*Adapted from Cancer Australia's definitions of breast cancer risk factors as at January 2020 (5) and previous research with breast screening service consumers (4).*

	Clear risk factor	Possible risk factor	Not a proven risk factor	Unsure
1. Family history of breast cancer	1	0	0	0
2. Physical inactivity	1	0	0	0
3. Antiperspirant deodorant use	0	0	1	0
4. Drinking alcohol ( <b>primary outcome</b> )	1	0	0	0
5. Eating processed meat	0	1	0	0
6. Being overweight	1	0	0	0

	10 grams	15 grams	20 grams	Unsure
In Australia, a standard drink contains ___ grams of alcohol (1, 2)	1	0	0	0

	1 standard drink	1.3 standard drinks	1.6 standard drinks	Unsure
An average restaurant serve of red wine contains... (2)	0	0	1	0

	Free-text response
What factors, if any, do you think can increase a woman's risk of developing breast cancer?	

	Correct answer
According to the latest Australian alcohol guidelines, it is recommended that healthy women should drink no more than ___ standard drinks per week (1)	10

## References

1. National Health and Medical Research Council. Australian guidelines to reduce the health risks from drinking alcohol. 2020. [www.nhmrc.gov.au/about-us/publications/australian-guidelines-reduce-health-risks-drinking-alcohol](http://www.nhmrc.gov.au/about-us/publications/australian-guidelines-reduce-health-risks-drinking-alcohol) (viewed Mar 2023).
2. Department of Health and Aged Care. Standard drinks guide. 2020. [www.health.gov.au/topics/alcohol/about-alcohol/standard-drinks-guide](http://www.health.gov.au/topics/alcohol/about-alcohol/standard-drinks-guide) (viewed Mar 2023).
3. Sobell L, Sobell M. Timeline follow-back: a technique for assessing self-reported ethanol consumption. In: Allen J, Litten R, editors. *Measuring alcohol consumption: psychosocial and biological methods*. Totowa, NJ: Humana Press, 1992.
4. Fisher B, Wilkinson L, Valencia A. Women's interest in a personal breast cancer risk assessment and lifestyle advice at NHS mammography screening. *J Public Health* 2017; 39: 113-121.
5. Cancer Australia. Breast cancer risk factors. 2019. [www.breastcancerriskfactors.gov.au/risk-factors](http://www.breastcancerriskfactors.gov.au/risk-factors) (viewed Jan 2023).

## Supplementary results

**Table 1.** Results of Cochran-Mantel-Haenszel tests for primary, secondary, and pre-specified exploratory alcohol and breast cancer literacy outcomes

Outcome	Cochran-Mantel-Haenszel test	<i>P</i>
<b>Primary outcome – alcohol-breast cancer literacy</b>		
Knowledge of alcohol as a clear breast cancer risk factor	$\chi^2(1,N=557)=16.2$	<0.001
<b>Secondary outcomes – alcohol literacy</b>		
Amount of alcohol in an Australian standard drink	$\chi^2(1,N=551)=9.8$	0.002
Standard drinks in an average restaurant serve of red wine	$\chi^2(1,N=557)=5.7$	0.017
Maximum weekly consumption recommended by Australian alcohol guidelines	$\chi^2(1,N=557)=1.9$	0.17
<b>Exploratory outcomes</b>		
<b>Alcohol-breast cancer literacy</b>		
Knowledge of alcohol as a breast cancer risk factor (free-text response)	$\chi^2(1,N=556)=13.4$	<0.001
<b>Knowledge of other breast cancer risk factors</b>		
Inactivity as a clear breast cancer risk factor	$\chi^2(1,N=557)=1.9$	0.17
Excess weight as a clear breast cancer risk factor	$\chi^2(1,N=557)=0.4$	0.55

**Table 2. Secondary outcomes: alcohol consumption exceeding Australian alcohol consumption guideline recommendations\***

Characteristic	Baseline (t0)			Week 4 (t1)			Week 12 (t2)			t1 v t0	t2 v t0	P (arm × time)
	N	n	Proportion (95% CI)	N	n	Proportion (95% CI)	N	n	Proportion (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	
More than ten standard drinks in a week on at least one of two preceding weeks												0.43
Control arm	279	38	14% (10–18%)	262	38	15% (11–19%)	252	32	13% (9.1–17%)	1.3 (0.6–2.8)	0.9 (0.4–1.9)	
Active arm	278	35	13% (9.2–17%)	257	41	16% (12–21%)	245	33	13% (9.7–18%)	2.5 (1.1–5.7)	1.6 (0.7–3.8)	
More than ten standard drinks in a week during both of the two preceding weeks												0.45
Control arm	279	25	9.0% (6.1–13%)	262	28	11% (7.5–15%)	252	26	10% (7.1–15%)	1.9 (0.7–5.6)	1.6 (0.6–4.7)	
Active arm	278	25	9.0% (6.1–13%)	257	26	10% (7.0–14%)	245	28	11% (8.0–16%)	2.6 (0.9–7.9)	4.2 (1.3–13)	
More than four standard drinks in a day (on at least one day)												0.15
Control arm	279	31	11% (7.9–15%)	262	19	7.3% (4.7–11%)	252	14	5.6% (3.3–9.2%)	0.4 (0.1–1.0)	0.2 (0.1–0.6)	
Active arm	278	40	14% (11–19%)	257	22	8.6% (5.7–13%)	245	27	11% (7.7–16%)	0.3 (0.1–0.8)	0.6 (0.3–1.4)	
More than four standard drinks in a day (on more than one day)												0.16
Control arm	279	16	5.7% (3.5–9.2%)	262	15	5.7% (3.5–9.3%)	252	11	4.4% (2.4–7.7%)	1.4 (0.4–5.1)	0.7 (0.2–2.7)	
Active arm	278	28	10% (7.0–14%)	257	17	6.6% (4.1–10%)	245	22	9.0% (6.0–13%)	0.5 (0.1–1.8)	1.5 (0.5–4.9)	

N = all outcome data, n = endorsed the outcome, CI = confidence interval.

\* Based on 14-day timeline follow-back.



**Table 3. Secondary outcomes: alcohol consumption during the past fortnight\***

	Baseline (t0)		Week 4 (t1)		Week 12 (t2)		t1 v t0		t2 v t0		P (arm × time)
	N	Mean (95% CI)	N	Mean (95% CI)	N	Mean (95% CI)	Unstandardised regression coefficient (95% CI)	Unstandardised regression coefficient (95% CI)	Unstandardised regression coefficient (95% CI)	Unstandardised regression coefficient (95% CI)	
Days on which alcohol was consumed											0.14
Control arm	279	3.4 (2.9–3.9)	262	3.4 (2.9–3.9)	252	3.2 (2.7–3.7)	0.0 (-0.3–0.3)	-0.2 (-0.5–0.0)			
Active arm	278	3.0 (2.6–3.5)	257	3.2 (2.7–3.6)	245	2.9 (2.5–3.4)	0.3 (-0.0–0.5)	0.2 (-0.1–0.4)			
Days on which more than two standard drinks were consumed											0.12
Control arm	279	1.5 (1.1–1.8)	262	1.4 (1.1–1.8)	252	1.7 (1.3–2.1)	0.0 (-0.3–0.3)	0.3 (0.0–0.6)			
Active arm	278	1.5 (1.2–1.8)	257	1.8 (1.4–2.2)	245	1.6 (1.2–2.0)	0.4 (0.1–0.7)	0.3 (0.0–0.6)			
Days on which more than four standard drinks were consumed											0.026
Control arm	279	0.4 (0.2–0.5)	262	0.3 (0.1–0.5)	252	0.2 (0.1–0.4)	0.0 (-0.2–0.2)	-0.1 (-0.3–0.1)			
Active arm	278	0.6 (0.3–0.8)	257	0.4 (0.2–0.6)	245	0.6 (0.4–0.9)	-0.1 (-0.2–0.1)	0.2 (0.0–0.3)			
Total standard drinks during fortnight											0.38
Control arm	279	7.5 (6.2–8.9)	262	7.7 (6.3–9.2)	252	7.3 (5.9–8.7)	0.4 (-0.6–1.3)	-0.2 (-1.1–0.8)			
Active arm	278	8.1 (6.4–9.9)	257	8.6 (6.8–10)	245	8.1 (6.3–9.8)	1.1 (0.1–2.0)	0.7 (-0.2–1.7)			

N = all outcome data, CI = confidence interval.

\* Based on 14-day timeline follow-back.

**Table 4. Secondary outcomes: alcohol consumption exceeding Australian alcohol consumption guideline recommendations; analyses restricted to 73 women (control arm, 38; active arm, 35) who reported exceeding guidelines**

	Baseline (t0)		Week 4 (t1)		Week 12 (t2)		t1 v t0		t2 v t0		P (arm × time)
	N	n	Proportion (95% CI)	N	n	Proportion (95% CI)	N	n	Proportion (95% CI)	Odds ratio (95% CI)	
<b>Exceeding national alcohol guidelines</b>											
More than ten standard drinks in a week during both of the two preceding weeks											0.52
Control	38	25	66% (49–79%)	33	19	58% (40–74%)	34	18	53% (36–69%)	0.4 (0.1–1.8)	0.3 (0.1–1.4)
Intervention	35	25	71% (54–84%)	27	17	63% (43–79%)	27	19	70% (50–85%)	0.6 (0.2–2.5)	1.1 (0.3–4.4)
More than four standard drinks in a day (on at least one day)											0.17
Control	38	15	39% (25–56%)	33	8	24% (12–42%)	34	7	21% (10–38%)	0.1 (0.0–1.0)	0.1 (0.0–0.7)
Intervention	35	25	71% (54–84%)	27	12	44% (27–64%)	27	17	63% (43–79%)	0.1 (0.0–0.7)	0.7 (0.1–3.9)
More than four standard drinks in a day (on more than one day)											0.53
Control	38	10	26% (14–43%)	33	7	21% (10–39%)	34	7	21% (10–38%)	0.6 (0.1–3.4)	0.6 (0.1–3.3)
Intervention	35	22	63% (45–78%)	27	12	44% (27–64%)	27	16	59% (39–76%)	0.3 (0.1–1.7)	1.3 (0.3–6.8)

N = all outcome data, n = endorsed the outcome, CI = confidence interval.

**Table 5. Secondary outcomes: alcohol consumption during the past fortnight; analyses restricted to 73 women (control arm, 38; active arm, 35) who reported exceeding guidelines**

	Baseline (t0)		Week 4 (t1)		Week 12 (t2)		t1 v t0		t2 v t0		P (arm × time)
	N	Mean (95% CI)	N	Mean (95% CI)	N	Mean (95% CI)	Unstandardised regression coefficient (95% CI)	Unstandardised regression coefficient (95% CI)			
Days on which alcohol was consumed											0.45
Control	38	11 (9.5–12)	33	9.7 (8.4–11)	34	9.2 (7.8–11)	-1.0 (-2.1–0.1)	-1.5 (-2.6–0.4)			
Intervention	35	9.4 (8.2–11)	27	8.3 (6.9–9.8)	27	8.7 (7.3–10)	-1.0 (-2.2–0.2)	-0.6 (-1.8–0.6)			
Days on which more than two standard drinks were consumed											0.74
Control	38	6.7 (5.3–8.1)	33	5.9 (4.1–7.6)	34	6.2 (4.4–8.1)	-0.9 (-2.5–0.7)	-0.4 (-2.0–1.1)			
Intervention	35	7.4 (6.1, 8.8)	27	7.2 (5.4–8.9)	27	7.0 (5.2–8.7)	-0.0 (-1.7–1.7)	-0.2 (-1.9–1.5)			
Days on which more than four standard drinks were consumed											0.014
Control	38	1.6 (0.6–2.6)	33	1.6 (0.4–2.9)	34	1.3 (0.2–2.3)	0.1 (-1.0–1.2)	-0.3 (-1.3–0.8)			
Intervention	35	3.7 (2.4–5.1)	27	2.8 (1.2–4.4)	27	4.9 (3.0–6.8)	-0.7 (-1.9–0.5)	1.4 (0.2–2.6)			
Total standard drinks during fortnight											0.64
Control	38	29 (25–32)	33	27 (22–32)	34	25 (21–29)	-2.3 (-7.6–3.0)	-4.1 (-9.3–1.2)			
Intervention	35	38 (30–45)	27	34 (24–43)	27	36 (27–45)	-3.3 (-9.1–2.5)	-1.4 (-7.2–4.4)			

N = all outcome data, CI = confidence interval.