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Older Australians' perceptions of alcohol-related harms and low-risk alcohol guidelines

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Abstract

Introduction and Aims. *Australia has an ageing population. Given the concomitant increase in the numbers and proportion of risky drinkers among older adults, research examining contributory factors is a priority. The current study examined older adults' estimates of the NHMRC low-risk drinking guidelines, consumption patterns and associated harms and self-identification of drinking type.* ***Design and Methods.*** *Data from respondents aged 50+ years (N = 11 886) in the 2016 National Drug Strategy Household Survey were subjected to secondary analyses. Estimates of low-risk drinking levels, perceived level of harm from current drinking, self-identification of drinking type and awareness of standard drinks and labelling were included. Data were examined for those aged 50–59 years and 60+.* ***Results.*** *Seventeen percent of older Australians drank at both long-term and short-term risk levels. Approximately 39% of males and 11% of females overestimated the long-term low-risk levels and 54% of males and 20% of females overestimated the short-term low-risk levels. Overestimation was highest among risky drinkers. Most older risky drinkers were aware of standard drinks and labelling; however, less than half perceived their drinking as harmful, instead identifying as social drinkers.* ***Discussion and Conclusions.*** *Although substantial gaps are evident in older respondents' estimates of low-risk drinking, additional public awareness campaigns are likely to be of limited use. Older peoples' engagement with the public health system presents 'windows of opportunity' to provide targeted, age-appropriate harm reduction strategies. Appropriate intervention and policy responses are required to direct resources to this emerging area of concern.* [Chapman J, Harrison N, Kostadinov V, Skinner N, Roche A. Older Australians' perceptions of alcohol-related harms and low-risk alcohol guidelines. *Drug Alcohol Rev* 2020;39:44–54]

Key words: alcohol consumption, harm reduction, Australians, older adults.

Introduction

Australia has a rapidly ageing population [1]. In 1927, Australians aged 65+ years comprised 5% of the population; this increased to 15% in 2017 and is anticipated to reach 22% by 2057 [2]. Correspondingly, the proportion of Australians over 50 years drinking alcohol at risky levels has increased significantly [3,4], similar to overseas trends [5]. By contrast, younger people are drinking at less risky levels [6,7]. Given the serious health implications of risky drinking [8–12], research examining contributory factors is a priority.

One explanation for high levels of alcohol consumption among older adults is poor health literacy [13], specifically lack of knowledge regarding safe drinking levels. The National Health and Medical Research Council (NHMRC) stipulates that healthy adults should drink no more than two standard drinks per day to reduce long-term risk of alcohol-related disease or injury, and no more than four standard drinks on a single occasion to reduce short-term risk [14].

However, there is little recent research examining the extent to which older Australians are aware of these guidelines, and how awareness may be associated with consumption patterns. Research among other population groups indicates that there is generally poor understanding of official alcohol guidelines, particularly among risky drinkers [15–18]. The limited available evidence suggests that this is also the case for older cohorts: a sample of older Australians (aged ≥60 years) was found to have similarly low levels of knowledge of alcohol guidelines, particularly older men [19]. Secondary analyses of 2010 National Drug Strategy Household Survey data investigating perceptions of low-risk drinking levels in the general population found that for male respondents, 62% of 50–59 year olds and 57% of 60+ year olds

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overestimated the number of drinks adult men could safely consume on a single occasion, while 24% and 18% of women overestimated the same-sex safe threshold [20]. Knowledge of standard drinks and alcohol beverage labelling; while higher than knowledge of guidelines, has also been found to decrease with age [21]. However, no research using current and nationally representative data has recently examined these issues, and the knowledge levels of the current cohort of older Australians are presently unknown.

Accurate estimates of the extent and nature of the knowledge levels of adults over 50 years of age are required to better inform targeted interventions and policy responses. Such initiatives are of high importance given the particular vulnerability of older adults to alcohol-related harms [8,11,22]. To date, the majority of alcohol research has concentrated on younger age groups with social, psychological and physiological characteristics that are highly distinct from older populations. Thus, a renewed focus on older age groups is warranted.

It is important to recognise that knowledge of safe drinking levels and alcohol guidelines do not necessarily translate to low-risk drinking behaviours [23,24]. There are a number of reasons why informed individuals may continue to drink above government recommended levels, including self-exempting or optimistic beliefs around the degree of harm from personal use in comparison to others [25], or a lack of confidence in public health messaging more broadly [26]. Indeed, a recent metasynthesis of 25 studies reported that self-perceptions as controlled and responsible drinkers are common in people over 50; and while older people tend to be aware of alcohol-related risks and harms these are typically attributed to other, more problematic drinkers [27]. Similarly, a recent systematic review of qualitative data reported scepticism about purported health risks from alcohol in adults aged 55+ [28].

Furthermore, alcohol use is closely tied to social identities, practices and enjoyment in older people [28], such that the myriad influences and contexts of drinking may override adherence to low-risk consumption, regardless of guideline knowledge. Concomitantly, recent Australian research found self-identification as a social drinker to be decreasing in Australia in all age groups except the over 50s [29]. Older persons may therefore consider alcohol use to be beneficial, for both social and health reasons [28,29]. Hence, when examining the relationship between alcohol-related knowledge and behaviour, inclusion of perceived harms from personal consumption and self-identification with drinker type/style may be useful to inform intervention strategies.

In summary, the extent of older Australians' current estimates of safe drinking guidelines, and the degree to which these estimates correspond with actual risk status and perceptions of personal harm and drinking style, remain unknown. This is an important oversight: a comprehensive understanding of the contributory factors underpinning observed increases in older adults' risky drinking is vital to inform future public health and clinical intervention efforts tailored for the unique needs of older groups. Using a large, nationally representative sample of older adults aged 50+ years, the current study therefore investigated:

1. Estimates of long- and short-term low-risk drinking levels as per NHMRC guidelines by sex, age group (50–59, 60+) and actual risk status;
2. Awareness of standard drinks and alcohol labelling by sex, age and risk status;
3. The association between estimates of low-risk drinking levels and perception of harm from personal consumption in those drinking at risky levels;
4. The association between estimates of low-risk drinking levels and self-identification of drinking type (i.e. occasional/light, social or heavy/binge drinker) in those drinking at risky levels.

Methods

Data source and sample demographic data

Data from the 2016 National Drug Strategy Household Survey (NDSHS) were subjected to secondary analyses. The NDSHS is conducted every 3 years in every state and territory of Australia, and uses a multi-stage stratified random sample design to collect data on alcohol and other drug use and attitudes. In 2016, respondents completed paper, telephone or online questionnaires; contact was made with 46 487 in-scope households and 23 772 complete and useable surveys were returned. This represents a co-operation rate of 51.5% (using the total number of dwellings where contact was made as the denominator) or a response rate of 34.7% (where eligible reporting units include cases of non-contact). These are higher than the rates obtained for the 2013 and 2010 NDSHS surveys. Detailed NDSHS methodology is available elsewhere [4].

For the purposes of the current study, only respondents aged 50 years and over (N = 11 886) were included in analyses. There is no standardised understanding of what constitutes 'old age'; while 65+ years has been used in some contexts as a working definition of 'elderly' [30], this is not applied consistently in research or practice [31]. Furthermore, the ageing process is highly heterogenous, with variations in genetics, lifestyle and overall health resulting in large differences between 'elderly' individuals [32]. Therefore, in order

to capture the full spectrum of older Australians, and in recognition of the fact that alcohol consumption is prevalent among those aged 50–59 years [33], a purposefully broad definition of 'older adult' as someone aged 50 years and over was applied. In order to provide a more nuanced interpretation of results, analyses were conducted on both the full sample as well as subgroups aged 50–59 and 60+ years.

Of the weighted study sample, 52.0% of respondents were female and 48.0% were male. An 'other (please specify)' sex option was excluded from the dataset due to small numbers (<0.10%).

Measures

Risky drinking and estimates of low-risk drinking levels. Long-term high-risk drinking was indicated by an average daily consumption of more than two standard drinks for both men and women, consistent with NHMRC guidelines (2009). Single-occasion consumption of five or more standard drinks at least monthly was used to indicate short-term high-risk drinking for both men and women [14].

Perceptions of low-risk drinking levels were measured by asking how many standard drinks: (i) a male or female adult could drink every day without adversely affecting their health (long-term risk); and (ii) a male or female adult could drink in a 6 h period before s/he puts their health at risk (short-term risk). Respondents answering >2 standard drinks for item (i) and >4 standard drinks for item (ii) were categorised as overestimating the guidelines. For all analyses, responses reflect estimates of own-sex guidelines only.

Knowledge of standard drinks and labelling. Two items indicated knowledge of standard drink units: 'before today, had you ever heard of a "standard drink" of alcohol?' (Y/N), and labelling: 'as far as you know, is the number of "standard drinks" shown on cans and bottles of alcoholic beverages?' (options Y/N/Do not know).

Perceived level of harm from current drinking and self-reported drinking category. Perceptions of the level of harm associated with personal consumption were measured by a single item: 'How harmful or beneficial do you think your current alcohol consumption is to your health?' scored on a 5-point scale from very harmful – very beneficial, plus a 'Do not know' option. Self-attribution by drinker type was assessed by the item: 'At the present time, do you consider yourself…?' with response options: non-drinker, ex-drinker, occasional, light, social, heavy or binge. Non- and ex-drinker categories were excluded and occasional/light and heavy/binge categories were collapsed, creating three drinker types for analysis.

Analyses

All descriptive analyses used weighted samples with the complex samples procedure in IBM SPSS Statistics Version 25. Proportion estimates and 95% confidence intervals (CI) were calculated with probability weighted data to be representative of the Australian population, but unweighted *n*'s are presented to indicate survey sample size. Differences between proportion estimates for group comparisons were considered significant if the 95% CIs did not overlap. Relative standard error was used to assess data quality. Extreme high values (z-scores > 3.29; n = 145) [34] on estimates of own-sex long-term and short-term low-risk guidelines were excluded to calculate reliable means and standard deviation of estimates [35].

Results

Alcohol consumption patterns

Of all older persons aged 50+, 22.9% (95% CI 21.9–24.0) reported abstaining from alcohol for the last 12 months; 16.8% (95% CI 16.0–17.7) reported drinking at long-term risk levels, and 17.0% (95% CI 16.1–17.8) reported drinking at short-term risk levels. Of all respondents identifying a drinking style (n = 11 735), 47.5% (95% CI 46.4–48.6) described themselves as an occasional or light drinker; 18.9% as a social drinker (95% CI 18.1–19.8), and 4.0% as a heavy or binge drinker (95% CI 3.6–4.4). A further 27.2% (95% CI 26.2–28.3) considered themselves a non-drinker and 2.4% (95% CI 2.1–2.8) an ex-drinker.

Estimates of long-term low-risk guidelines

In terms of understanding the level of consumption that equated with long-term low risk, approximately half the sample (n = 5590; 47.9%, 95% CI = 46.7, 49.1) nominated 'Do not know'. This proportion was higher for females than males (52.9%, 95% CI = 51.3, 54.5 vs. 42.5%, 95% CI = 40.9, 44.2); those aged 60+ vs. 50–59 year olds (53.3%, 95% CI = 52.0, 54.7 vs. 39.0%, 95% CI = 37.1, 41.0) and for those drinking at low vs. high long-term risk levels (45.1%, 95% CI = 43.7, 46.5 vs. 31.2%, 95% CI = 28.9, 33.7), respectively.

For all respondents that estimated the number of drinks that an adult could drink every day for many years without adversely affecting their health, the mean

was 2.3 (SD = 1.5) for men and 1.3 (SD = 1.0) for women (Table 1). Thirty-eight point 7% (95% CI = 36.7, 40.7) of men overestimated the long-term risk guidelines compared to 10.5% (95% CI = 9.3, 11.8) of female respondents.

The majority (>50%) of respondents overestimated the long-term risk guideline by approximately one standard drink, with a higher proportion of men (46.8%, 95% CI = 43.6, 50.1) overestimating by 2+ drinks compared to women (35.0%, 95% CI = 29.1, 41.5). There was little difference in the overestimation of two drinks or more by age for either sex (Table 1).

Among those drinking above long-term risk levels, risky drinking males estimated that adult males could drink 3.2 (SD= 1.6) standard drinks. The majority (68.7%, 95% CI = 65.1, 72.1) overestimated the guidelines, and more than half (55.8%, 95% CI = 51.6, 60.0) overestimated by two or more standard drinks. The highest proportion of over-estimators was found in men aged over 60, drinking at high long-term risk levels (74.0%, 95% CI = 69.8, 77.8; compared to, for example, men aged 50–59 drinking at high long-term risk levels, 62.1%, 95% CI = 56.1, 67.9). For women, around one-third (33.2%, 95% CI = 27.9, 39.0) of high long-term risky drinkers overestimated the guideline, with 42.5% (95% CI = 32.3, 53.3) overestimating by 2+ drinks. However, the overlap in 95% CI indicates that the proportion of female overestimators for the long-term guidelines did not differ for those aged 50–59 and 60+ years (Table 1).

Estimates of short-term low-risk guidelines

For short-term low-risk consumption levels, again, approximately half the sample selected 'Do not know' (n = 6008; 51.1%, 95% CI = 50.0, 52.3). This proportion was higher for females than males (56.6%, 95% CI = 55.0, 58.1 vs. 45.2%, 95% CI = 43.6, 46.8), those aged 60+ compared to 50–59 years (57.1%, 95% CI = 55.7, 58.4 vs. 41.3%, 95% CI = 39.5, 43.2) and for those drinking at low vs. high long-term risk levels (48.8%, 95% CI = 47.3, 50.2 vs. 32.3%, 95% CI = 29.9, 34.8), respectively.

In general, a greater proportion of respondents overestimated the guideline for short-term low risk (Table 2) than long-term low risk (Table 1). In total, men estimated that an adult man could drink 5.4 (SD = 3.2) standard drinks in a six-hour period before putting his health at risk and women estimated 3.3 (SD = 2.1). Over half (53.6%, 95% CI = 51.4, 55.8) of men and 20.3% (95% CI = 18.6, 22.1) of women overestimated the short-term guideline. For both males and females, a higher proportion of 50–59 year olds

Table 1. *Mean estimates of long-term low-risk drinking levels, proportions overestimating the National Health and Medical Research Council guidelines and extent of overestimation, by sex, age and long-term risk consumption pattern (Reproduced from 2016 National Drug Strategy Household Survey)*

	Estimate for male respondents					Estimate for female respondents				
				Number of standard drinks overestimated[b], % (95% CI)					Number of standard drinks overestimated[b], % (95% CI)	
	n[a]	Mean estimate (SD)	Proportion overestimated guideline, % (95% CI)	1	2+	n[a]	Mean estimate (SD)	Proportion overestimated guideline, % (95% CI)	1	2+
Total	3126	2.3 (1.5)	38.7 (36.7, 40.7)	53.2 (49.9, 56.4)	46.8 (43.6, 50.1)	2961	1.3 (1.0)	10.5 (9.3, 11.8)	65.0 (58.5, 70.9)	35.0 (29.1, 41.5)
50–59	1070	2.2 (1.5)	36.2 (32.8, 39.7)	52.9 (47.1, 58.7)	47.1 (41.3, 52.9)	1174	1.2 (1.0)	8.9 (7.2, 10.9)	65.0 (54.0, 74.6)	35.0 (25.4, 46.0)
60+	2056	2.3 (1.6)	40.7 (38.3, 43.1)	53.3 (49.7, 57.0)	46.7 (43.0, 50.3)	1787	1.4 (1.0)	11.9 (10.3, 13.7)	64.9 (56.7, 72.3)	35.1 (27.7, 43.3)
Abstainer	346	1.5 (1.5)	25.4 (20.4, 31.1)	62.5 (51.0, 72.8)	37.5 (27.2, 49.0)	456	1.0 (1.0)	7.8 (5.4, 11.1)	58.1 (39.7, 74.5)	41.9 (25.5, 60.3)
LT low risk	1724	1.9 (1.3)	24.7 (22.5, 27.1)	64.5 (58.8, 69.8)	35.5 (30.2, 41.2)	2108	1.2 (0.9)	7.6 (6.3, 9.0)	72.4 (63.3, 79.9)	27.6 (20.1, 36.7)
50–59	578	1.8 (1.3)	24.5 (20.5, 28.9)	59.0 (48.9, 68.5)	41.0 (31.5, 51.1)	832	1.1 (0.9)	5.3 (3.8, 7.3)	70.4 (52.8, 83.6)	29.6[c] (16.4, 47.2)
60+	1146	1.9 (1.2)	24.9 (22.3, 27.7)	68.6 (62.5, 74.1)	31.4 (25.9, 37.5)	1276	1.4 (0.9)	9.5 (7.7, 11.6)	73.3 (62.3, 82.0)	26.7 (18.0, 37.7)
LT high risk	1021	3.2 (1.6)	68.7 (65.1, 72.1)	44.2 (40.0, 48.4)	55.8 (51.6, 60.0)	362	2.1 (1.1)	33.2 (27.9, 39.0)	57.5 (46.7, 67.7)	42.5 (32.3, 53.3)
50–59	362	3.0 (1.5)	62.1 (56.1, 67.9)	46.8 (39.2, 54.5)	53.2 (45.5, 60.8)	181	2.0 (1.1)	27.7 (20.8, 35.8)	58.3 (41.9, 73.0)	41.7 (27.0, 58.1)
60+	659	3.4 (1.6)	74.0 (69.8, 77.8)	42.4 (37.5, 47.5)	57.6 (52.5, 62.5)	181	2.3 (1.0)	39.9 (32.0, 48.5)	56.9 (42.5, 70.2)	43.1 (29.8, 57.5)

[a]Unweighted data. [b]Percentages calculated from total number of respondents overestimating guideline; estimates (n = 2) presented as half a standard drink were rounded up to the nearest whole number. Mean estimate (SD) and proportions weighted to be representative of total Australian population. [c]Relative standard error 25–50%. CI, confidence interval; LT, long-term.

Table 2. *Mean estimates for short-term low-risk drinking levels, proportion of respondents who overestimated the guidelines and extent of overestimation, by sex, age and short-term risk consumption pattern (Reproduced from 2016 National Drug Strategy Household Survey)*

	Estimate for male respondents					Estimate for female respondents				
				Number of standard drinks overestimated[b], % (95% CI)					Number of standard drinks overestimated[b], % (95% CI)	
	n[a]	Mean estimate (SD)	Proportion overestimated guideline, % (95% CI)	1–2	3+	n[a]	Mean estimate (SD)	Proportion overestimated guideline, % (95% CI)	1–2	3+
Total	2952	5.4 (3.2)	53.6 (51.4, 55.8)	52.1 (49.2, 54.9)	47.9 (45.1, 50.8)	2713	3.3 (2.1)	20.3 (18.6, 22.1)	62.6 (57.5, 67.3)	37.4 (32.7, 42.5)
50–59	1014	5.6 (3.3)	57.7 (54.0, 61.3)	49.8 (45.2, 54.5)	50.2 (45.5, 54.8)	1118	3.6 (2.3)	27.6 (24.7, 30.8)	61.7 (55.2, 67.9)	38.3 (32.1, 44.8)
60+	1938	5.2 (3.1)	50.4 (47.8, 52.9)	54.1 (50.5, 57.7)	45.9 (42.3, 49.5)	1595	2.9 (1.9)	13.7 (11.9, 15.8)	64.1 (55.8, 71.6)	35.9 (28.4, 44.2)
Abstainer	318	3.6 (3.4)	25.6 (20.4, 31.6)	42.8 (32.3, 54.0)	57.2 (46.0, 67.7)	418	2.2 (2.2)	9.7 (6.8, 13.6)	42.8 (27.1, 60.2)	57.2 (39.8, 72.9)
ST low risk	1639	5.1 (2.9)	46.6 (43.6, 49.5)	59.4 (55.2, 63.4)	40.6 (36.6, 44.8)	1955	3.3 (2.0)	18.4 (16.5, 20.5)	66.1 (59.9, 71.7)	33.9 (28.3, 40.1)
50–59	481	5.4 (2.9)	50.0 (44.7, 55.3)	57.7 (50.5, 64.6)	42.3 (35.4, 49.5)	774	3.6 (2.2)	23.7 (20.4, 27.3)	67.4 (59.2, 74.7)	32.6 (25.3, 40.8)
60+	1158	4.8 (2.9)	44.4 (41.2, 47.7)	60.6 (55.5, 65.4)	39.4 (34.6, 44.5)	1181	3.0 (1.8)	13.9 (11.7, 16.4)	64.1 (54.3, 72.8)	35.9 (27.2, 45.7)
ST high risk	960	6.6 (3.2)	74.4 (71.1, 77.5)	45.6 (41.3, 49.9)	54.4 (50.1, 58.7)	308	4.3 (2.1)	47.7 (41.3, 54.1)	59.6 (49.9, 68.6)	40.4 (31.4, 50.1)
50–59	417	6.9 (3.5)	76.9 (71.8, 81.3)	43.9 (37.4, 50.5)	56.1 (49.5, 62.6)	197	4.5 (2.3)	54.9 (46.9, 62.7)	58.0 (46.5, 68.7)	42.0 (31.3, 53.5)
60+	543	6.2 (2.9)	71.6 (67.3, 75.6)	47.8 (42.1, 53.5)	52.2 (46.5, 57.9)	111	4.1 (1.9)	33.3 (24.2, 43.8)	64.9 (46.9, 79.4)	35.1 (20.6, 53.1)

[a]Unweighted data. [b]Percentages calculated from total number of respondents overestimating guideline. Mean estimate (SD) and proportions weighted to be representative of total Australian population. CI, confidence interval; ST, short-term.

overestimated the guidelines than those aged 60+, although this was only slightly higher for men (57.7%, 95% CI = 54.0, 61.3 vs. 50.4%, 95% CI = 47.8, 52.9, respectively); for women this figure was doubled (27.6%, 95% CI = 24.7, 30.8 vs. 13.7%, 95% CI = 11.9, 15.8, respectively). Of male and female over-estimators, 47.9% (95% CI = 45.1, 50.8) and 37.4% (95% CI = 32.7, 42.5) overestimated the short-term low-risk guideline by 3 or more standard drinks.

The proportion overestimation for short-term risk guidelines was greater among those who drank at short-term risky levels. For male short-term risky drinkers, 74.4% (95% CI = 71.1, 77.5) overestimated the guideline, compared to 46.6% (95% CI = 43.6, 49.5) of men who drank at short-term low-risk levels. Male short-term risky drinkers estimated that the low-risk level was 6.6 (SD = 3.2) standard drinks on average, and 56.1% (95% CI = 49.5, 62.6) of male 50–59 year olds overestimated the guideline by three or more drinks.

Approximately half (47.7%, 95% CI = 41.3, 54.1) the women who drank at short-term risky levels overestimated the guideline, compared to 18.4% (95% CI = 16.5, 20.5) of women who drank at short-term low-risk levels. Among female low-risk and high-risk drinkers, the proportions overestimating the guideline was higher in those aged 50–59 (23.7%, 95% CI = 20.4, 27.3 and 54.9%, 95% CI = 46.9, 62.7) than those over 60 (13.9%, 95% CI = 11.7, 16.4 and 33.3%, 95% CI = 24.2, 43.8, respectively).

Awareness of standard drinks and alcohol labelling

Among all respondents, 88.2% (95% CI = 87.0, 89.3) of men and 81.4% (95% CI = 80.1, 82.6) of women indicated that they had heard of a standard drink (Table 3). Awareness of standard drinks was lower in those over 60 compared to those aged 50–59, particularly women (77.1%, 95% CI = 75.5, 78.7 vs. 88.6%, 95% CI = 86.8, 90.3).

For both males and females, awareness of standard drinks labelling on cans and bottles was higher among those drinking at short-term risk (85.2%, 95% CI = 82.8, 87.3 and 81.4%, 95% CI = 77.0, 85.1) than either abstainers (28.2%, 95% CI = 23.9, 32.8 and 17.9%, 95% CI = 15.3, 20.8) or short-term low-risk drinkers (68.6%, 95% CI = 66.6, 70.6 and 52.9%, 95% CI = 51.0, 54.9). The same pattern could be found for those drinking at long-term risk (Table 3). A smaller proportion of low-risk drinkers (both long- and short-term) reported awareness of labelling than high-risk drinkers. Fewer women indicated awareness than men (48.8%, 95% CI = 47.2, 50.5 vs. 67.9%, 95%

Table 3. *Awareness of standard drink units and container labelling, by sex, age and long-term and short-term risk consumption pattern (Reproduced from 2016 National Drug Strategy Household Survey)*[a]

	Male respondents						Female respondents					
			Aware that standard drink units are shown on cans and bottles, % (95% CI)					Aware that standard drink units are shown on cans and bottles, % (95% CI)				
	n[b]	Heard of standard drink, % (95% CI)	n[b]	Yes	No	Do not know	n[b]	Heard of standard drink, % (95% CI)	n[b]	Yes	No	Do not know
Total	5471	88.2 (87.0, 89.3)	4771	67.9 (66.3, 69.5)	6.6 (5.8, 7.5)	25.4 (24.0, 27.0)	6314	81.4 (80.1, 82.6)	5108	48.8 (47.2, 50.5)	6.4 (5.6, 7.2)	44.8 (43.1, 46.5)
50–59	1638	90.5 (88.3, 92.4)	1492	76.9 (74.2, 79.5)	4.9 (3.7, 6.4)	18.2 (15.9, 20.7)	2055	88.6 (86.8, 90.3)	1813	62.2 (59.5, 64.9)	6.6 (5.4, 8.1)	31.2 (28.6, 33.8)
60+	3833	86.7 (85.4, 88.0)	3279	62.0 (60.0, 63.9)	7.8 (6.7, 9.0)	30.3 (28.4, 32.2)	4259	77.1 (75.5, 78.7)	3295	39.6 (37.7, 41.6)	6.2 (5.3, 7.2)	54.1 (52.1, 56.2)
Abstainer	948	63.7 (59.6, 67.5)	613	28.2 (23.9, 32.8)	12.1 (9.2, 15.9)	59.7 (54.7, 64.5)	1581	56.6 (53.6, 59.6)	907	17.9 (15.3, 20.8)	8.1 (6.2, 10.6)	74.0 (70.5, 77.1)
LT low risk	2991	92.1 (90.9, 93.2)	2708	69.2 (67.1, 71.2)	6.9 (5.9, 8.1)	23.9 (22.1, 25.8)	4022	89.5 (88.3, 90.7)	3563	52.9 (51.0, 54.9)	5.9 (5.1, 6.8)	41.2 (39.3, 43.1)
LT high risk	1440	97.2 (95.5, 98.2)	1374	84.8 (82.5, 86.9)	3.4 (2.5, 4.6)	11.8 (9.9, 14.0)	572	97.0 (94.7, 98.3)	540	78.7 (74.4, 82.5)	5.6 (3.7, 8.2)	15.7 (12.4, 19.7)
ST low risk	2999	91.8 (90.5, 92.9)	2710	68.6 (66.6, 70.6)	7.1 (6.0, 8.3)	24.3 (22.5, 26.2)	4077	89.9 (88.7, 91.0)	3621	52.9 (51.0, 54.9)	5.9 (5.1, 6.8)	41.1 (39.3, 43.1)
ST high risk	1432	97.7 (96.2, 98.6)	1372	85.2 (82.8, 87.3)	3.3 (2.4, 4.5)	11.5 (9.6, 13.8)	515	94.9 (91.8, 96.9)	482	81.4 (77.0, 85.1)	5.5 (3.6, 8.2)	13.1 (9.8, 17.3)

[a]Proportions weighted to be representative of total Australian population. [b]Unweighted data. CI, confidence interval; LT, long-term; ST, short-term.

CI = 66.3, 69.5, respectively), and those aged 60+ were least aware of labelling (Table 3).

Perception of harm from personal consumption

Of all respondents who had consumed alcohol in the last 12 months and indicated their perception of alcohol-related harm (n = 7927), most (54.2%, 95% CI = 52.8, 55.5) considered their drinking to be neither harmful nor beneficial to their health; 28.2% (95% CI = 27.0, 29.4) considered it beneficial and 17.7% (95% CI = 16.7, 18.7) considered it harmful (Table S1, Supporting Information). More respondents aged 50–59 (23.1%, 95% CI = 21.3, 25.1) than 60+ (13.8%, 95% CI = 12.8, 14.9) perceived their drinking to be harmful. Generally, a higher proportion of males and females drinking at long-and short-term risk perceived their drinking to be harmful than those drinking at low risk (data available in Table S1).

Risky drinkers' estimates of low-risk guidelines and perception of harm

For all respondents who reported drinking at risky levels, approximately 9% (long-term risky drinkers 9.1%, n = 175, 95% CI = 7.6, 10.9; short-term risky drinkers 8.9%, n = 169, 95% CI = 7.4, 10.6) reported that they did not know the level of harm from their current drinking. Among the remaining respondents who drank at risky levels, approximately half perceived their drinking to be harmful (long-term risky drinkers, 46.2%, n = 826, 95% CI = 43.5, 48.9; short-term risky drinkers, 44.1%, n = 773, 95% CI = 41.3, 46.9).

Figure 1 shows the estimates of short-term guidelines by perception of harm in respondents drinking at short-term risk. Overestimation of the guidelines was generally associated with a lower perception of harm. However, only approximately half (47.7%, 95% CI = 40.4, 55.1) of male risky drinkers who did not overestimate the guidelines reported their drinking to be harmful. The rest considered their drinking to be neither harmful nor beneficial (41.0%, 95% CI = 33.8, 48.5) or beneficial to health (11.3%, 95% CI = 7.7, 16.4).

This pattern was similar for women. In female short-term risky drinkers who did not overestimate the guideline, only 56.8% (95% CI = 47.8, 65.4) perceived harm (Figure 1). This figure was similar for those who did overestimate the guideline (54.9%, 95% CI = 45.3, 64.1), demonstrating that guideline knowledge did not impact the degree of harm perceived from current drinking.

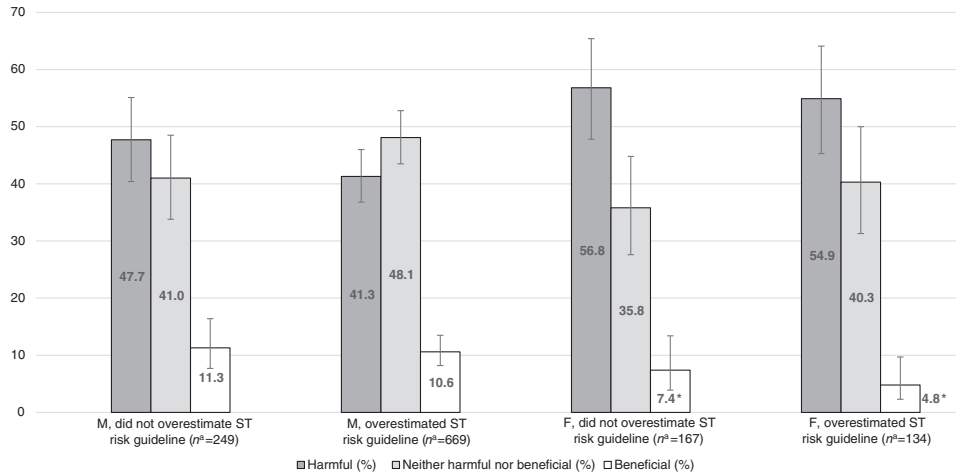

Figure 1. *Short-term risky drinkers' estimation of guidelines by perceptions of harm from current drinking (%). Data source: 2016 National Drug Strategy Household Survey.* Note. *Risky drinking level (drinking at short-term risk) for each column corresponds with estimate of low-risk guideline (guideline for short-term risk). Perceived harms based on self-report of current drinking. Percentages weighted to be representative of total Australian population. Error bars indicate 95% confidence intervals. *Relative standard error 25–50%. [a]Unweighted data. Beneficial; 'very beneficial' or 'somewhat beneficial'; F, female respondent; Harmful, 'very harmful' or 'somewhat harmful', M, male respondent; ST, short-term. 'Do not know' response excluded.*

Data pertaining to estimates of long-term guidelines by perception of harm can be found in Table S1.

Risky drinkers' estimates of low-risk guidelines and self-identification of drinking type (occasional/light, social or heavy/binge drinker)

Approximately, half of male short-term risky drinkers self-identified as social drinkers (52.8%, 95% CI = 49.2, 56.5), and approximately one quarter identified as occasional or light drinkers (25.0%, 95% CI = 22.0, 28.3). These figures were similar regardless of whether or not the guidelines were overestimated (Figure 2).

For female short-term risky drinkers, the most frequently selected drinking type was again social drinker, which was similar regardless of whether or not the guidelines were overestimated [46.5% (95% CI = 37.8, 55.3) in for those who did not overestimate the guideline, and 45.4% (95% CI = 35.8, 55.3) for over-estimators].

Data pertaining to estimates of long-term guidelines by drinking style can be found in Figure S2. Interestingly, approximately one-third (32.5%, 95% CI = 27.0, 38.6) of all female risky drinkers self-identified as

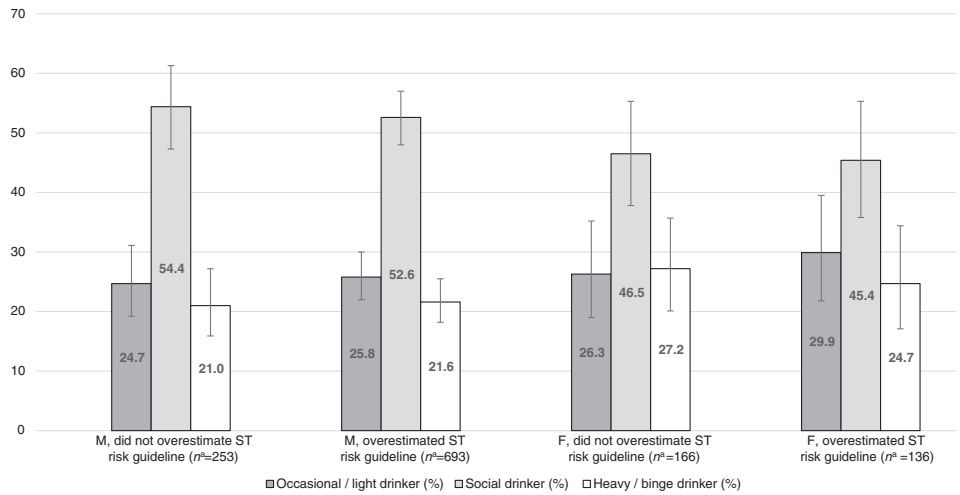

Figure 2. *Short-term risky drinkers' estimation of guidelines by self-identification of drinking style (%). Data source: 2016 National Drug Strategy Household Survey.* Note. *Risky drinking level (drinking at short-term risk) for each row corresponds with estimation of low-risk guideline (guideline for short-term risk). Percentages weighted to be representative of total Australian population. Error bars indicate 95% confidence intervals. [a]Unweighted data. F, female respondent; M, male respondent; ST, short-term.*

occasional or light drinkers. The group who most frequently self-identified as an occasional or light drinker were females drinking at long-term risky levels, who did not overestimate the long-term risk guideline, however, the overlap in 95% CI indicates that the proportion did not differ by sex or estimates of the low-risk guidelines (Figure S2).

Discussion

There is greater interest in the health and wellbeing of older Australians as this population increases in size and longevity. Such interest extends to the significantly changing patterns of alcohol use among people over 50 years of age. This study is one of few that has examined older people's perceptions of low-risk drinking and associated harms. It has identified a range of important findings that can inform future clinical interventions, harm reduction strategies and workforce development policies.

Overall, the proportion of older Australians who could accurately estimate the low-risk drinking levels designated by the NHMRC was relatively small. Nonetheless, when compared to Livingston's 2010 sample [20], smaller proportions of older people overestimated the long- and short-term drinking guidelines, and the mean estimates for low-risk drinking levels were lower. The only exception to this was the proportion of 50–59 year old female respondents who over-estimated the short-term guideline, which increased from 24.0% in 2010 to 27.6% in 2016. Overall, however, this indicates that knowledge of safe drinking levels has increased among most groups of older people in recent years. Despite this, risky alcohol consumption patterns in this age group have also increased over the past decade [36], suggesting that countervailing factors other than knowledge of risks and harms alone may be at play in shaping the drinking patterns and behaviours of older age groups.

Important variations in the findings emerged for the younger cohorts (i.e. aged 50–59 years) compared to those aged over 60. For example, estimates of the amount of alcohol that could be consumed to avoid long-term risk were lower among those aged 60+, while estimates of short-term risk levels were lower among those aged 50–59 years. These age cohort variations may reflect, among other things, different drinking patterns in these age groups; older adults aged 60+ tend to drink more regularly but fewer drinks on a given occasion [4].

In line with previous work [16,20] and not unexpectedly, a higher proportion of risky drinkers overestimated the consumption guidelines than did low-risk drinkers. In addition, a higher proportion of men over-estimated safe drinking levels than women, and men's mean estimates were consistently higher than women's estimates. This gender difference was substantial and apparent among both low-risk and risky drinkers. By contrast, a larger proportion of female risky drinkers perceived their own consumption to be harmful, compared to male risky drinkers.

This suggests that there may be gender-based differences in health literacy levels, with older women more likely to have an accurate understanding of both the official guidelines and their own drinking behaviours. Conversely, women were more likely than men to report that they did not know the safe drinking guidelines, and that they were not familiar with standard drinks/product labelling. This may be a product of women's lower consumption levels in general (and therefore less familiarity with drinking-related guidelines/labelling). These findings flag the need for specifically tailored and nuanced interventions in relation to risky drinking among older people, with a particular focus on older men. To-date, little effort has been directed to the development of such interventions or programs.

While knowledge of Australia's drinking guidelines was generally low, most older people knew what constituted a standard drink, and to a lesser extent were aware of labelling on alcohol beverages. In general, awareness in these areas was lower among women and those aged 60+. High-risk drinkers had greater awareness of alcohol labelling, suggesting exposure to this information had limited deterrence effect.

Beyond knowledge of the guidelines, it was concerning that a large proportion of older people who drank at risky levels did not perceive their drinking to be harmful to health. Poor perception of harm from personal consumption was even found among risky drinkers who could accurately estimate the low-risk guidelines. Various factors may contribute to these apparently poor levels of understanding of the harms associated with alcohol; including self-exemptions, perceptions of aged-related immunity to harms and resistance to change [25,37,38]. Improving this age group's understanding of alcohol-related harms is an imperative given their greater vulnerability and susceptibility to harmful consequences even with modest levels of consumptions well within the current NHMRC guideline levels [11]. A need exists to address this issue not only among older people themselves but also among their family and support networks and especially among general practitioners and other health care providers. General practitioners routinely communicate alcohol-related issues with patients, and most report sufficient skills and confidence to manage such issues [39].

As found in the population at large [40], there was also a high level of discordance in terms of self-

attribution to a drinking category that matched actual behaviours. Most risky drinkers, regardless of their guideline knowledge, self-assigned themselves to benign categories of social drinker. Approximately one-third of risky drinkers incorrectly self-identified as occasional or light drinkers. Such self-identification mis-categorisations in drinking type by risky drinkers, in addition to implying that they may be oblivious to alcohol-related harms, indicates that knowledge of the guidelines may make little difference to how older people perceive their drinking. Given the high value social role of alcohol in Australia [41,42] and particularly the changing role that alcohol plays in the lives of older people [43–45], a closer investigation into motivations and beliefs underlying alcohol-related risk perception is needed.

Implications

These findings have several important implications. In particular, they highlight the large yet shrinking population of older Australians – particularly older men – who have limited knowledge of both safe drinking guidelines and the risks associated with their own level of consumption. At the same time, they also indicate that the observed increases in risky consumption are likely not driven by these knowledge-related factors.

Consequently, it is unlikely that educational efforts, when implemented in isolation, will be efficacious in reducing risky drinking behaviours [24,46,47]. Any public education campaigns seeking to increase older people's knowledge of alcohol guidelines should be complemented with additional systemic strategies.

For example, there is substantial scope to address the workforce development needs of key care providers and to ensure that they are adequately skilled to appropriately identify and intervene where an older person's drinking patterns may constitute risk of harm. In the primary care setting, older people present more frequently than other sub-population groups [48]. Common presentations include high prevalence low severity conditions, where alcohol may be contraindicated or represent a greater potential harm than under other circumstances, for example, hypertension, diabetes, weight gain, sleep disorders, memory loss and falls [49]. These presentations afford 'teachable moments' [50] demonstrated to increase chances of behaviour change.

More serious health-related conditions are also implicated in alcohol use among older people including heart disease, stroke, mental health problems and cancer [8–10]. The implications and types of response strategies indicated from our current study highlight the need to note issues such as the little-known relationship between alcohol and cancer [51] and breast cancer specifically, which is of particular salience for women >50 years [52].

Furthermore, older people face substantial barriers in relation to seeking advice or receiving treatment for alcohol-related problems [53]. For example, older people may perceive stigma in relation to help-seeking for problem drinking [37,54] and healthcare professionals may be reluctant to discuss substance use with older adults [8]. The physiological and psychosocial characteristics and needs of older people in relation to alcohol use are often overlooked by health professionals [54,55]. Age-appropriate resources and techniques for clinical practice (e.g. safe drinking guidelines and alcohol screening tools) are also required for encouraging low-risk drinking in older adults.

This study has been informative on several levels. First, it illustrates that improvements in knowledge of drinking guidelines have occurred over time despite significant concurrent increases in risky drinking among older people. Second, it indicates that educational interventions are unlikely to be an effective response mechanism given the variable patterns of knowledge, beliefs and behaviours found in these age groups. To date, the limited examination of the multiple and variable drivers and motivators for drinking among older people constitutes a major gap in our evidence base where clearly research is needed. Finally, the poor perception and understanding of alcohol-related harms among this vulnerable population group is a stark reminder of the need for greater resources to be directed to this area in general, especially given the major population growth occurring in older age groups [56].

Conflict of Interest

The authors have no conflicts of interest.

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Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Table S1. Perception of harm from current drinking, by sex and long-term and short-term risk consumption pattern, in respondents drinking alcohol. Data source: 2016 National Drug Strategy Household Survey.

Figure S1. Long-term risky drinkers' estimation of guidelines by perceptions of harm from current drinking (%). Data source: 2016 National Drug Strategy Household Survey. Note. Risky drinking level (drinking at long-term risk) for each column corresponds with estimate of low-risk guideline (guideline for long-term risk). Percentages weighted to be representative of total Australian population. Error bars indicate 95% confidence intervals. Perceived harms based on self-report of current drinking. * Relative standard error 25–50%. [a] Unweighted data. Beneficial, 'very beneficial' or 'somewhat beneficial'; F, female respondent; Harmful, 'very harmful' or 'somewhat harmful'; LT, long-term; M, male respondent. 'Do not know' response excluded.

Figure S2. Long-term risky drinkers' estimation of guidelines by self-identification of drinking style (%). Data source: 2016 National Drug Strategy Household Survey. Note. Risky drinking level (drinking at long-term risk) for each row corresponds with estimation of low-risk guideline (guideline for long-term risk). Percentages weighted to be representative of total Australian population. Error bars indicate 95% confidence intervals. [a] Unweighted data. F, female respondent; LT, long-term; M, male respondent.