



Which parents provide zero-alcohol beverages to adolescents? A survey of Australian parents' practices and intentions

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ABSTRACT

Objective: Zero-alcohol beverages (<0.5% alcohol by volume) appear and taste similar to alcoholic beverages but are regulated similarly to soft drinks in many countries, blurring the distinction between alcoholic and non-alcoholic beverages. How parents view provision of zero-alcohol beverages to adolescents is likely a key determinant of adolescent consumption. We investigated factors associated with parents' provision of zero-alcohol beverages to adolescents, including attitudes toward zero-alcohol beverages and demographic, knowledge, and behavioural factors known to be associated with provision of alcoholic beverages.

Methods: We conducted an online cross-sectional survey of $N = 1197$ Australian parents of adolescents aged 12–17 years in April–May 2022. We examined associations with zero-alcohol beverage provision using binomial logistic regression, and with future provision intentions using multinomial logistic regression analyses.

Results: Factors significantly associated ($p < .001$) with parents' provision and future intentions to provide zero-alcohol beverages to their adolescent included beliefs that zero-alcohol beverages had benefits for adolescents (Adjusted Odds Ratio [AOR] 2.69 (provision); 3.72 (intentions)), provision of alcoholic beverages (AOR 2.67 (provision); 3.72 (intentions)), and an incorrect understanding of alcohol guidelines for adolescents (AOR 2.38 (provision); 1.95 (intentions)).

Conclusions: Parents' provision and intentions to provide zero-alcohol beverages were associated with beliefs about zero-alcohol beverages as well as some factors associated with provision of alcoholic beverages. Precautionary advice to parents that the provision of zero-alcohol beverages may serve to normalise alcohol consumption may be warranted.

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1. Introduction

Zero-alcohol beverages share the appearance, taste, and often branding of alcoholic beverages, but contain very small amounts of alcohol (Okaru and Lachenmeier, 2022). In Australia, the setting of this study, the threshold is <0.5% alcohol by volume (Food Standards Australia New Zealand, 2017). These beverages are classified as non-alcoholic beverages under Food Standards Australia New Zealand Code 2.6.2, and regulated accordingly (Food Standards Australia New Zealand, 2017). Unlike alcoholic beverages, they can be sold in non-licensed premises such as supermarkets and convenience stores, often alongside soft drinks, and may generally be purchased by people aged under 18 years (Bury et al., 2023).

Zero-alcohol beverages may assist some people who drink alcohol to reduce their consumption (Jané Llopis et al., 2022). However, population level-benefits from substitution may be minimal (Rehm et al., 2023). For adolescents yet to initiate alcohol consumption, zero-alcohol beverages may serve as a gateway to alcohol use due to their availability and resemblance to alcohol (Miller et al., 2022). This possibility is concerning because alcohol is particularly harmful for adolescents through neurodevelopmental impacts (Cservenka and Brumback, 2017), increased risk of injury (Lensvelt et al., 2018), mental health harms (Miller et al., 2007), risky sexual behaviour (Agius et al., 2013), and increased likelihood of developing harmful patterns of drinking in adulthood (Hingson et al., 2006).

Parents are a key influence on adolescents' access to both alcoholic (Mattick et al., 2018; Ryan et al., 2010; Stockings et al., 2016; van der Kruk et al., 2023) and non-alcoholic (Campbell et al., 2007; Vereecken et al., 2010; Yee et al., 2017) beverages, so are likely to shape adolescents' attitudes toward and consumption of zero-alcohol beverages. Zero-alcohol beverages blur the distinction between alcoholic and non-alcoholic beverages, and thus present a conundrum: should parents privilege their alcohol-like appearance and taste, or their soft-drink-like regulatory status and lack of intoxicating effects? Drinking an alcoholic beverage is perceived as a signal of coming of age – a behaviour that is disapproved for children but viewed as normal or even expected once a person reaches an 'appropriate' age (Room, 2004). Most parents expect that their children will eventually begin consuming alcohol once the age that they deem 'appropriate' is reached, as a signifier of progression toward adulthood (Paglia and Room, 1998). Some parents supply alcohol to adolescents in the belief (despite contrary evidence (Mattick et al., 2018)) that this will teach responsible drinking and minimise harms from unsupervised alcohol consumption (Gilligan and Kypry, 2012; Roberts et al., 2010; Wadolowski et al., 2016) – helping to guide their adolescent toward coming of age. Non-alcoholic beverages, however, typically do not carry this symbolic meaning; for example, soft drink consumption is typically viewed by parents to be acceptable within childhood (Hoare et al., 2014; Miller et al., 2020).

How parents view and provide zero-alcohol beverages is likely to shape the potential of these drinks to serve as a gateway for adolescent alcohol consumption. A representative survey of adults from the United Kingdom found that 67% of respondents believed that it is acceptable for someone under 18 years of age to consume a zero-alcohol beverage at home; however, respondents comprised both parents and non-parents (Corfe et al., 2020). In a previous study by our research team, interviews with 38 Australian parents of adolescents found that zero-alcohol beverages were predominantly viewed as 'adult' beverages, rather than soft drinks. Views and reported provision practices varied across interview participants: many parents were concerned that provision could normalise alcohol consumption and act as a precursor to alcohol initiation, although some supported moderate provision in 'appropriate' contexts, such as celebratory occasions at which alcohol might be consumed by adults (Harrison et al., in press).

In the present study, we extended this earlier work by examining attitudes to zero-alcohol beverages among a large sample of Australian parents, and assessed the association between these attitudes and

provision of zero-alcohol beverages. We investigated the age from which parents viewed drinking zero-alcohol beverages as acceptable and beliefs about the potential for zero-alcohol beverages to substitute or promote consumption of alcoholic beverages. We also examined associations with parental provision of alcoholic beverages, as well as behavioural, knowledge, and demographic factors known to be associated with this provision. These factors were: an incorrect understanding of national guidelines around adolescent alcohol consumption (Booth et al., 2023); risky parental alcohol consumption (Booth et al., 2023; Ward and Snow, 2011); a permissive parenting style (Booth et al., 2023); older adolescent age (Jongenelis et al., 2018; Ward and Snow, 2011); and older parent age (Booth et al., 2023). Whether these factors are also associated with provision of zero-alcohol beverages provides an indicator of whether parents are supplying both beverage types under the same rationale of facilitating coming of age whilst minimising harms. Thus, in the present study, we aimed to assess how these attitudinal, behavioural, knowledge, and demographic factors were associated with (1) parents' provision of zero-alcohol beverages to adolescents and (2) parents' intentions to provide zero-alcohol beverages to adolescents before they turn 18.

2. Methods

2.1. Participants and procedure

Eligible participants were parents of children aged 12–17 years living in Australia. Participants were recruited from an online panel to participate in a cross-sectional online survey in April 2022, for a broader study focused on parental provision of alcohol (Bowden et al., 2022). Demographic quotas ensured approximately even numbers of mothers and fathers and representation from all Australian states and territories. $N = 1197$ participants completed the approximately 25-min survey, met the panel provider's data quality checks, and were reimbursed approximately AUD5. All participants gave informed consent. The study had approval from the Flinders University Human Ethics Low Risk Panel (5389), and met the institution's guidelines for the protection of human participants concerning safety and privacy.

2.2. Measures

Items used in the present study were a subset of items from the broader study. Zero-alcohol beverages were defined as "non-alcoholic wine, bottled virgin apple cider, or other similar drinks with no alcohol or an alcohol content of less than 0.5% alcohol by volume. This does not refer to other kinds of drinks that have no alcohol or a trace amount – such as soft drinks, coffees, teas, or fruit juices – or diluted alcohol drinks (e.g. champagne with orange juice, beer shandy)." This text was accompanied by an image showing a range of zero-alcohol beverages. For items referring to 'their child', respondents were asked to consider their eldest child aged 12 to 17 years.

2.2.1. Provision behaviours and intentions

2.2.1.1. Provision of zero-alcohol beverages. Participants were asked if they had ever given or bought zero-alcohol beverages for their child (responses: Yes, No). Those who reported any provision were asked how often they give or buy these beverages for their child in different settings (Table 1, adapted from Gilligan et al. (2014) and Jongenelis et al. (2018)). Responses were on a scale from 1 'Never' to 6 'More than once a week', collapsed to 'Never', 'Less than once a month', and 'Monthly or more' for analysis.

2.2.1.2. Intentions to provide zero-alcohol beverages. Participants were asked if they intend to give or buy their child zero-alcohol beverages before they turn 18 years old in different settings (Table 1). Participants

Table 1

Provision and future intentions to provide zero-alcohol beverages to adolescents under 18 years of age overall and by context among a sample of Australian parents in 2022 ($N = 1197$).

	Provision %		Intention to provide %	
Yes (any context)	12.1		21.7	
Undecided	–		19.9	
No	87.9		58.4	
Context of provision	No provision %	Provide less than once per month %	Provide monthly or more %	
To drink at home with dinner	90.1	4.5	5.4	10.2
To drink at a family function/special occasion (directly supervised)	89.7	5.8	4.5	11.9
To drink at home when they are not directly supervised	93.3	2.6	4.1	3.6
To take to parties or special occasions when other adults are NOT supervising	92.9	2.8	4.3	4.8
To have as a sip/diluted drink under supervision	90.6	4.8	4.6	6.7

could respond ‘Yes’ to any of the settings, or if no settings applied, select ‘Unsure/undecided’ or ‘No – none of the above.’

2.2.2. Attitudes toward zero-alcohol beverages

2.2.2.1. Beliefs about zero-alcohol beverages. Participants indicated the extent to which they agreed with seven attitudinal statements about zero-alcohol beverages, adapted from [Davies et al. \(2022\)](#) and [Harrison et al., 2024](#), shown in Supplementary Table 1, on a scale from 1 ‘Strongly disagree’ to 5 ‘Strongly agree.’ Based on a principal components analysis (details in Supplementary materials), we computed a ‘zero-alcohol benefits’ score as the mean of five items (Cronbach’s $\alpha = 0.87$), while the item “These products can influence an adolescent to drink more regularly” was retained as a categorical variable, with responses collapsed to ‘Disagree’, ‘Neither agree nor disagree’, and ‘Agree.’

2.2.2.2. Acceptable age for zero-alcohol consumption. Participants indicated at what age they thought it is acceptable “to drink alcohol-free/de-alcoholised or very low-strength beer, cider, wine, or spirits (less than 0.5% alcohol by volume),” among a broader set of behaviours (adapted from [Paglia and Room \(1998\)](#)). Response options were in single years from age 0–25, ‘26 or older’, or ‘Never okay’.

2.2.3. Behavioural and knowledge variables associated with provision of alcohol

2.2.3.1. Provision of alcoholic beverages. Participants were asked “How often do you give your child alcohol” in the same settings as for zero-alcohol beverages ([Table 1](#)) ([Gilligan et al., 2014](#); [Jongenelis et al., 2018](#)). Participants responding ‘Never’ to all items were classified as not having provided alcohol; others were classified as having provided alcohol.

2.2.3.2. Understanding of Australian Alcohol Guideline for children and people under 18 years of age. The current Australian Alcohol Guideline recommends that “To reduce the risk of injury and other harms to

health, children and people under 18 years of age should not drink alcohol” ([National Health and Medical Research Council, 2020](#)). Understanding was operationalised based on responses to two questions, “What do you think is the maximum number of alcoholic drinks per day a healthy adolescent under 15 years of age can consume if they want to minimise the risks associated with alcohol consumption?” and “What do you think is the maximum number of alcoholic drinks per day a healthy adolescent aged 15–17 years can consume if they want to minimise the risks associated with alcohol consumption?” Responding 0 to both questions was categorised as correct understanding; other response combinations were categorised as incorrect.

2.2.3.3. Parental risky drinking. Risky alcohol consumption was measured using the three-item Alcohol Use Disorders Identification Test – Consumption ([Bush et al., 1998](#)); a score ≥ 5 out of 12 was categorised as ‘risky consumption’ ([Fischer et al., 2021](#); [Rumpf et al., 2002](#)).

2.2.3.4. Parenting style. Parenting style was measured using the 30-item Parental Authority Questionnaire – Revised ([Reitman et al., 2002](#)), which includes three 10-item sub-scales reflecting Authoritative, Authoritarian, and Permissive parenting styles. Authoritarian parenting styles attempt to control child behaviour, authoritative styles attempt to guide children’s activities through reasoning, and permissive styles privilege children’s desires ([Baumrind, 1968](#)) (see Supplementary materials for how dominant parenting styles were assigned).

2.2.4. Demographics

Participants reported their gender and age (in years), gender and age range (12–15 years or 16–17 years) of their child, household income (pre-tax, in seven bands; collapsed to <AUD60,000, AUD60,000- < AUD100,000, AUD100,000- < AUD150,000, AUD150,000+), education (collapsed to no university and university), and postcode. Postcodes were mapped to the Australian Bureau of Statistics Greater Capital City Statistical Areas ([Australian Bureau of Statistics, 2021](#)), with respondents from capital cities classified as ‘metropolitan’ and others as ‘regional’.

2.3. Analyses

We analysed data using IBM SPSS Statistics 28 ([IBM Corp, 2021](#)). Analyses were not pre-registered and should be considered exploratory. A type 1 error rate of $\alpha = 0.05$ was considered to indicate statistical significance. After obtaining descriptive statistics on sample characteristics and outcome variables, we used binomial logistic regression to examine associations with parents’ zero-alcohol beverage provision to adolescents. We used multinomial logistic regression to examine associations with parents’ future intentions to provide zero-alcohol beverages. For both sets of analyses, we initially conducted a series of bivariate binomial or multinomial logistic regressions regressing the dependent variable (zero-alcohol beverage provision or intentions) onto each explanatory variable. Those explanatory variables that were significant in the bivariate logistic regressions were then included in a multivariable model. Box-Tidwell tests were conducted to confirm that relationships between continuous variables (zero-alcohol benefits score and age) and the logit transformation of the dependent variable were linear.

3. Results

3.1. Sample characteristics

Detailed sample characteristics are in Supplementary Table 2. About half the sample was female (50.7%), with a mean age of 45.5 years (range: 24–81 years). Almost half had a university education (46.5%) and 71.6% lived in a metropolitan area. For 60.5%, their child was aged

12–15 years. About half (53.0%) of the adolescents were male. The most common parenting style was authoritative (69.6%). Most parents (63.6%) did not consume alcohol at risky levels, and most parents (74.5%) showed an understanding consistent with the Australian Alcohol Guideline for under 18 s. About a third of parents (37.9%) had provided alcohol to their adolescent, which is within the range of previous parent-reported prevalence rates of parental supply (24.4%–48.0% (van der Kruk et al., 2023)).

About half (50.3%) indicated that it was acceptable to start drinking zero-alcohol beverages at an age of 18 years or older, compared with 57.3% for a full drink of alcohol. By comparison, 29.9% nominated 16 or 17 years (versus 31.2% for a full drink of alcohol) and 19.8% nominated an age before 16 years (versus 11.5%). The mean zero-alcohol benefit score was 3.1/5 (Standard Deviation 0.9), corresponding roughly with the response category ‘Neither agree nor disagree.’ About half of the sample (52.6%) agreed that “These products can influence an adolescent to drink alcohol more regularly.”

3.2. Provision of zero-alcohol beverages

Table 1 shows how often parents reported providing or intending to provide zero-alcohol beverages in different settings. Overall, 12.1% of parents in the sample reported that they had ever given or bought their child zero-alcohol beverages (in any context), and 21.7% reported intentions to provide in the future before the child reached age 18. Another 19.9% were unsure or undecided whether they would provide zero-alcohol beverages before age 18, while 58.4% indicated that they would not provide zero-alcohol beverages to a child aged under 18 years. Parents most often provided or intended to provide zero-alcohol

Table 2

Logistic regression analyses: associations with any reported provision of zero-alcohol beverages to adolescents among a sample of Australian parents in 2022 (N = 1197).

Independent variables	Bivariate			Multivariable		
	Odds ratio (OR)	95% CI	P	AOR	95% CI	p
Attitudes toward zero-alcohol beverages						
Zero-alcohol benefit score (continuous variable)	3.08	2.39, 3.96	<0.001	2.69	2.03, 3.55	<0.001
These products can influence an adolescent to drink alcohol more regularly	Disagree	Ref				0.534
	Neither	0.99	0.59, 1.68			
	Agree	0.82	0.49, 1.34			
Acceptable age to drink zero-alcohol beverages	18 years or more	Ref	<0.001	Ref		0.054
	16 or 17 years	1.74	1.13, 2.68	1.30	0.79, 2.12	
	Under 16 years	3.57	2.33, 5.47	1.85	1.12, 3.06	
Behavioural and knowledge variables associated with provision of alcohol						
Any provision of alcoholic beverages	No	Ref	<0.001	Ref		<0.001
	Yes	4.90	3.35, 7.17	2.67	1.74, 4.10	
Understanding of guideline for under 18 s	Correct	Ref		Ref		<0.001
	Incorrect	4.23	2.96, 6.05	<0.001	2.38	1.57, 3.61
Parental risky drinking	No	Ref	0.255			
	Yes	1.23	0.86, 1.75			
Parenting style	Authoritarian	Ref	<0.001	Ref		0.086
	Authoritative	1.21	0.71, 2.07	1.44	0.80, 2.59	
	Permissive	3.29	1.80, 6.01	2.15	1.08, 4.27	
Demographics						
Child age	12–15 years	Ref				
	16–17 years	1.28	0.90, 1.82	0.164		
Parent age (continuous variable)	<\$60,000	Ref		Ref		
	\$60,000 - < \$100,000	2.65	1.49, 4.70	2.65	1.40, 5.01	
	\$100,000 - < \$150,000	2.45	1.37, 4.37	2.01	1.03, 3.90	
	\$150,000+	2.05	1.10, 3.81	0.008	1.38	0.67, 2.85
Income	No university	Ref		Ref		
	University	1.74	1.22, 2.48	0.002	1.73	1.13, 2.65
Level of education	Regional	Ref				
	Metropolitan	1.40	0.93, 2.11	0.109		

Only terms significant in bivariate regression models were entered into the multivariable model. Multivariable model $\chi^2(11) = 198.7, p < .001$; Cox & Snell $R^2 = 0.15$; Nagelkerke $R^2 = 0.29$; Hosmer-Lemeshow goodness of fit test, $p = .32$.

beverages to drink at a family function or special occasion or at home with dinner.

Table 2 presents the results of logistic regressions examining associations with provision of zero-alcohol beverages to adolescents (in any setting). There were no significant bivariate associations with beliefs that zero-alcohol products can influence an adolescent to drink alcohol more regularly, parental risky drinking, child age, parent age, and regional versus metropolitan residence.

Seven predictors showed a significant bivariate association with provision of zero-alcohol beverages, so were entered into a multivariable logistic regression. Among attitudinal variables, beliefs that zero-alcohol beverages have benefits for adolescents were significantly associated with parents' provision of zero-alcohol beverages (Adjusted Odds Ratio [AOR] 2.69, 95% Confidence Interval [CI] 2.03, 3.55). Behavioural and knowledge variables significantly associated with parents' provision included provision of alcoholic beverages (AOR 2.67, 95% CI 1.74, 4.10) and an incorrect understanding of the Australian Alcohol Guideline for under 18 s (AOR 2.38, 95% CI 1.57, 3.61). Demographic variables associated with provision included having a university education (AOR 1.73, 95% CI 1.13, 2.65) and a household income of \$60,000–100,000 (AOR 2.65, 95% CI 1.40, 5.01) or \$100,000–150,000 (AOR 2.01, 95% CI 1.03, 3.90), versus less than \$60,000 [reference]. Acceptable age to drink zero-alcohol beverages and parenting style were not significantly associated with parents' provision of zero-alcohol beverages in the multivariable model.

3.3. Future intentions to provide zero-alcohol beverages

Table 3 presents the results of multinomial logistic regressions

Table 3

Multinomial logistic regression analyses: associations with future intentions to provide zero-alcohol beverages to adolescents before they turn 18 years old among a sample of Australian parents in 2022 (N = 1197).

Independent variables		Bivariate					Multivariable				
		Intend to provide versus do not intend to provide		Unsure/undecided whether will provide versus do not intend to provide		p	Intend to provide versus do not intend to provide		Unsure/undecided whether will provide versus do not intend to provide		p
		OR	95% CI	OR	95% CI		AOR	95% CI	AOR	95% CI	
Attitudes toward zero-alcohol beverages											
Zero-alcohol benefit score (continuous variable)		4.35	3.45, 5.47	2.61	2.12, 3.20	<0.001	3.72	2.88, 4.80	2.33	1.86, 2.91	<0.001
These products can influence an adolescent to drink alcohol more regularly	Agree	Ref		Ref		<0.001	Ref		Ref		0.004
	Neither	1.76	1.27, 2.42	1.90	1.38, 2.61		1.64	1.12, 2.42	1.49	1.05, 2.10	
	Disagree	1.93	1.30, 2.88	1.05	0.65, 1.69		2.10	1.26, 3.50	1.04	0.61, 1.77	
Acceptable age to drink zero-alcohol beverages	18 years or more	Ref		Ref		<0.001	Ref		Ref		<0.001
	16 or 17 years	3.45	2.43, 4.89	3.56	2.55, 5.05		2.59	1.70, 3.92	2.53	1.75, 3.67	
	Under 16 years	5.29	3.63, 7.71	3.03	2.01, 4.56		2.66	1.67, 4.23	2.19	1.39, 3.46	
Behavioural and knowledge variables associated with provision of alcohol											
Any provision of alcoholic beverages	No	Ref		Ref		<0.001	Ref		Ref		<0.001
	Yes	5.78	4.24, 7.87	2.18	1.60, 2.96		3.72	2.58, 5.38	1.64	1.16, 2.31	
Understanding of guideline for under 18 s	Correct	Ref		Ref		<0.001	Ref		Ref		<0.001
	Incorrect	3.65	2.68, 4.97	1.19	0.83, 1.71		1.95	1.33, 2.86	0.93	0.62, 1.39	
Parental risky drinking	No	Ref		Ref		0.124					
	Yes	1.31	0.98, 1.76	1.24	0.92, 1.68						
Parenting style	Authoritarian	Ref		Ref		<0.001	Ref		Ref		0.032
	Authoritative	1.41	0.92, 2.14	1.29	0.86, 1.92		1.72	1.04, 2.83	1.46	0.94, 2.25	
	Permissive	2.75	1.65, 4.57	0.88	0.48, 1.60		1.77	0.95, 3.30	0.84	0.44, 1.61	
Demographics											
Child age	12–15 years	Ref		Ref		0.089					
	16–17 years	0.91	0.68, 1.21	0.71	0.52, 0.97		0.94, 0.99	0.95, 0.99	0.95, 0.99	0.002	
Parent age (continuous variable)	0.97	0.99	0.98	1.00	<0.001	0.97	0.97	0.97	0.99	0.002	
Income	<\$60,000	Ref		Ref		0.017	Ref		Ref		0.041
	\$60,000- <\$100,000	1.91	1.26, 2.91	1.39	0.91, 2.13		2.00	1.20, 3.32	1.59	1.00, 2.54	
	\$100,000- <\$150,000	1.59	1.04, 2.45	1.66	1.09, 2.52		1.25	0.73, 2.15	1.74	1.08, 2.80	
	\$150,000+	1.89	1.21, 2.95	1.36	0.86, 2.16		1.46	0.82, 2.58	1.45	0.85, 2.45	
	No university	Ref		Ref		0.016	Ref		Ref		0.064
Level of education	University	1.40	1.05, 1.86	0.85	0.63, 1.15		1.47	1.01, 2.15	0.94	0.66, 1.33	
	Regional	Ref		Ref		0.021	Ref		Ref		0.012
Region	Regional	Ref		Ref		0.021	Ref		Ref		0.012
	Metropolitan	1.43	1.02, 1.99	0.82	0.60, 1.13		1.80	1.20, 2.71	1.06	0.74, 1.50	

Only terms significant in bivariate regression models were entered into the multivariable model. Multivariable model $\chi^2(30) = 476.33, p < .001$; Cox & Snell $R^2 = 0.33$; Nagelkerke $R^2 = 0.38$.

examining associations with future intentions to provide zero-alcohol beverages to adolescents (in any setting), or uncertainty whether to provide zero-alcohol beverages, compared with no intention to provide these beverages, before their adolescent turns 18 years old. As with provision, there was no significant bivariate association between future intentions and parental risky drinking or child age. However, ten predictors showed a significant bivariate association with future intentions to provide zero-alcohol beverages to the adolescent, including all seven predictors associated with provision, beliefs that zero-alcohol products can influence an adolescent to drink alcohol more regularly, parent age, and regional versus metropolitan residence. These ten predictors were entered into the multivariable model.

In this model, among attitudinal variables, likelihood of intending to provide zero-alcohol beverages (versus not provide [reference]) was significantly associated with beliefs that zero-alcohol beverages have benefits for adolescents (AOR 3.72, 95% CI 2.88, 4.80); not agreeing with the statement that “These products can influence an adolescent to drink alcohol more regularly” (disagreeing: AOR 2.10, 95% CI 1.26, 3.50; neither agreeing nor disagreeing: AOR 1.64, 95% CI 1.12, 2.47 (versus agreeing [reference])); and a belief that it is acceptable to drink zero-alcohol beverages before the age of 18 (16–17 versus ≥ 18 [reference]: AOR 2.59, 95% CI 1.70, 3.92; < 16 versus ≥ 18 [reference]: AOR 2.66, 95% CI 1.67, 4.23). Among behavioural and knowledge variables, intending to provide zero-alcohol beverages was significantly more

likely for parents who: had provided alcoholic beverages to their child (AOR 3.72, 95% CI 2.58, 5.38); showed an incorrect understanding of the Australian Alcohol Guideline for under 18 s (AOR 1.95, 95% CI 1.33, 2.86); and had an authoritative parenting style (versus authoritarian [reference], AOR 1.72, 95% CI 1.04, 2.83). Demographic variables significantly associated with intentions to provide zero-alcohol beverages included: income between \$60,000 and \$100,000 (versus <\$60,000 [reference], AOR 2.00, 95% CI 1.20, 3.32) and metropolitan residence (versus regional [reference], AOR 1.80, 95% CI 1.20, 2.71). Conversely, the likelihood of intending to provide zero-alcohol beverages was negatively associated with parent age (AOR 0.97, 95% CI 0.94, 0.99). Level of education was not significantly associated with intended provision in the multivariable model.

Similarly to factors associated with intended provision, parents being unsure whether they will provide zero-alcohol beverages (versus not provide [reference]) was more likely with: beliefs that zero-alcohol beverages have benefits for adolescents (AOR 2.33, 95% CI 1.86, 2.91); beliefs that it was acceptable to drink zero-alcohol beverages before the age of 18 (16–17 versus ≥ 18 [reference]: AOR 2.53, 95% CI 1.75, 3.67; <16 versus ≥ 18 [reference]: AOR 2.19, 95% CI 1.39, 3.46); and provision of alcoholic beverages (AOR 1.64, 95% CI 1.16, 2.31); and was less likely with older parent age (AOR 0.97, 95% CI 0.95, 0.99). In contrast to factors associated with intended provision, being uncertain (versus not intending to provide [reference]) was associated with neither agreeing nor disagreeing with the statement that “These products can influence an adolescent to drink alcohol more regularly” (versus agreeing [reference], AOR 1.49, 95% CI 1.05, 2.10) and having a household income between \$100,000 and \$150,000 (versus <\$60,000 [reference], AOR 1.74, 95% CI 1.08, 2.80).

4. Discussion

In this Australian sample, most parents (87.9%) had not provided zero-alcohol beverages to their adolescent(s). A large minority of parents either intended (21.7%) or were unsure whether they would provide (19.9%) zero-alcohol beverages to their adolescent before they turned 18. Provision and intentions to provide were more likely among parents who believed zero-alcohol beverages had benefits and were acceptable for adolescents to drink. Unexpectedly, a belief that zero-alcohol beverages can influence adolescents to drink alcohol more regularly was not associated with provision of zero-alcohol beverages, but was associated with future intentions to provide zero-alcohol beverages. Attitudes typically show stronger associations with behavioural intentions than behaviours themselves (Kim and Hunter, 1993), and parents' provision may not have been planned. Uncertainty about whether zero-alcohol beverages can influence an adolescent to drink alcohol was also associated with uncertainty about future provision intentions, suggesting that forming a view about this influence may be important to shaping parents' future actions.

Both provision and future intentions to provide zero-alcohol beverages were associated with provision of alcoholic beverages, suggesting a similar group of parents is engaging in both behaviours. Like parental alcohol provision (Booth et al., 2023), zero-alcohol provision was associated with incorrect understanding of the Australian Alcohol Guidelines, and at the bivariate level, with a permissive parenting style. Parents who are less aware of the harms of adolescent alcohol consumption and prioritise their child's desires, consistent with a permissive style, may be more willing to facilitate their ‘coming of age’ through both zero-alcohol and alcohol provision.

Unlike parental alcohol provision (Booth et al., 2023; Jongenelis et al., 2018; Ward and Snow, 2011), we found no association between zero-alcohol beverage provision and adolescent age or parents' own risky drinking, and a negative association between parent age and provision intentions. The lack of association with adolescent age may suggest that some parents who provided zero-alcohol beverages had not viewed this provision as part of a coming-of-age process, perhaps

providing the beverage for reasons such as novelty. Consistent with this, more parents indicated that zero-alcohol beverages, compared to full alcoholic drinks, were acceptable to drink under the age of 16 years. Nonetheless, most parents in this sample indicated that zero-alcohol beverages were only acceptable drinks for adults or older adolescents, suggesting that, like alcohol consumption, consumption of zero-alcohol beverages was broadly viewed as a signal of coming of age.

The sizeable minority of parents expressing uncertainty about provision intentions suggests that some parents may appreciate guidance. In the absence of definitive evidence regarding benefits and harms, but amid concerns that zero-alcohol beverages could serve to normalise and act as a gateway to alcohol consumption (Miller et al., 2022), a precautionary approach advising against consumption by minors seems appropriate. Health authorities could also consider campaigns to raise awareness of national alcohol consumption guidelines, since awareness of these guidelines is associated with reduced parental supply of both alcoholic (Booth et al., 2023) and, in this study, zero-alcohol beverages. There has been limited promotion of the Australian Alcohol Guidelines, especially since their revision in 2020, with even health professionals showing poor awareness (Searby et al., 2023). Consideration should also be given to regulating zero-alcohol beverages in a similar manner as alcoholic beverages, reducing their availability to those under the age of 18 years and restricting advertising placement and content. Such regulation would send a clear signal that these drinks are not recommended for minors.

4.1. Strengths and limitations

This study appears to be the first study globally to examine factors associated with parental provision of zero-alcohol beverages, using a large, diverse sample of parents of adolescents living in Australia. As the sample was recruited from an online panel, findings may not generalise. Items on zero-alcohol beverages were included within a broader survey focused on parental alcohol provision, which may have cued parents to think about zero-alcohol beverages in that context. The survey did not measure parents' consumption of zero-alcohol beverages or assess the temporal order of alcohol and zero-alcohol provision. There is a need for longitudinal research, and research from the perspective of adolescents, to uncover this temporal order and clarify whether zero-alcohol provision can substitute for alcohol provision, or if it is a gateway to adolescent alcohol consumption.

5. Conclusion

In this study, factors associated with parents' provision and intentions to provide zero-alcohol beverages to adolescents included beliefs that zero-alcohol beverages had benefits for adolescents, provision of alcoholic beverages, and an incorrect understanding of alcohol guidelines for adolescents. Longitudinal research is needed to assess the net benefits versus harms of zero-alcohol beverages for adolescents. In the interim, a precautionary approach that involves advising parents against the provision of zero-alcohol beverages may be warranted.

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CRedit authorship contribution statement

Ashlea Bartram: Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Nathan J. Harrison:** Writing – review & editing, Project administration, Methodology, Conceptualization. **Christina A. Norris:** Writing – review & editing, Project administration, Methodology. **Susan Kim:** Writing – review & editing, Methodology, Formal analysis. **Simone Pettigrew:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Robin Room:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Caroline Miller:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Ian Olver:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Rebecca Jenkinson:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Marina Bowshall:** Writing – review & editing, Methodology, Funding acquisition, Conceptualization. **Jacqueline A. Bowden:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Conceptualization.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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Data availability

Data will be made available on request.

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Appendix A. Supplementary data

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