Sunscreen use: a theory-based interventional study using HAPA

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Received 5 March 2020
Revised 17 March 2020
Accepted 8 April 2020

Abstract

Purpose – The current study was aimed to assess health action process approach (HAPA) effectiveness in sunscreen using among paddy workers

Design/methodology/approach – This interventional study was conducted on 177 paddy workers from Rudsar city. The subjects were randomly assigned into motivational, volitional and control groups. The motivational and volitional groups received the educational intervention based on HAPA. Three groups were evaluated in terms of HAPA constructs, intention and behavior at three times before the intervention, immediately afterward and one month later. Chi-square, repeated measure test were used to analyze the data using SPSS software version 19.

Findings – The mean age was 47.78 ± 12.66. The majority of the participants were female (69.3%) and had diploma. based on repeated measure test results the score of the use of sunscreen during the time in intervention groups as well as between the three groups were changed. Based on the results of this study, the score of the constructs of both phases of HAPA in the two groups (motivational and volitional) compared to control group was significantly improved ($p < 0.05$).

Practical implications – The study shows the use of HAPA for the behavioral change related to sunscreen use among the paddy workers as the high-risk group.

Originality/value – North of Iran

Keywords Sunscreen, Health action process approach, Skin cancer, Paddy worker, Interventional study

Paper type Research paper

1. Introduction

Skin cancer is the most common cancer in the world (Apalla *et al.*, 2017) and has turned to one of the public health concerns in the world (Stepheus *et al.*, 2018). This cancer is one of the most common cancers in most parts of the world (Rouhani *et al.*, 2009; Saridi *et al.*, 2014; Kasparian *et al.*, 2009) and is the most common type of cancer in the Middle East (Afzali *et al.*, 2013).

The UV radiation is the main factor in skin cancer (Lancy and Alwan, 2013) which can be prevented by some sun protection behaviors (Gordon *et al.*, 2009). Studies in Iran indicate a high prevalence of this type of cancer and its incidence is 10.13% per 100,000 populations (Nabizade *et al.*, 2010).

The authors would like to thanks all paddy workers for participating in study and research deputy of Alborz University of Medical Sciences for financial support. This study was conducted by the funding from the Research deputy of Alborz University of Medical Sciences (The funding of the study includes data collection and analysis).

Health Education
Vol. 120 No. 3, 2020
pp. 217-227

0965-4283
DOI 10.1108/HE-03-2020-0013

Outdoor workers have a great risk of developing skin cancer (Sena *et al.*, 2016). Sun protection strategies, such as the use of sunscreen and appropriate coating, reduce the risk of UV radiation and prevent the development of skin cancer (Sánchez *et al.*, 2016), but accepting and retaining skin cancer-preventative behavior is difficult (Craciun *et al.*, 2012).

Behavioral interventions have the potential to improve the health status of individuals (Greaves *et al.*, 2011), and theories are needed to design and evaluate health interventions as well as they are needed to explain and predict health behaviors (Lippke and Ziegelmann, 2008). Many studies recommend using theory as a basis for designing appropriate interventions and creating favorable behavioral changes (Avery *et al.*, 2013; Webb *et al.*, 2010). In this regard, many studies have been conducted based on the health action process approach (HAPA). Craciun *et al.* conducted a study on the recognition of facilitators for sunscreen use with HAPA on 205 women with an average age of 25 years, which was based on the role of coping planning as one of the components of solar radiation preventive interventions (Craciun *et al.*, 2012). Hubbard *et al.*, in their quasi-experimental study using HAPA in adolescents, showed that interventions based on HAPA improve the sunscreen using in adolescents (Hubbard *et al.*, 2018).

HAPA consists of three stages (intention, planning and behavior) and two phases of motivation and volition. During the motivation phase, the person intends to change the high-risk behavior, and during the volition phase, the intention becomes real behavior. In the motivation phase, risk perception, outcome expectation and action self-efficiency and in the volition phase, action planning, coping planning and coping self-effectiveness play a key role.

But according to a search made by researchers, no study has been carried out by using this approach in high-risk individuals such as paddy workers who spend the majority of their daily time in the sun. Therefore, this study aims to apply the HAPA to promote the use of sunscreen in paddy workers in the north of Iran.

2. Material and methods

2.1 Study design

This interventional study was conducted in the summer of 2017 on paddy workers in Rudsar. The research population was all paddy workers in Rudsar. All the villages in Rudsar were identified to select the samples, and then five villages were selected randomly (simple random). Five villages include Rahim Abad, Hadi Kiyashor, Haji Abad, Machiyan, Kaldareh.

2.2 Inclusion criteria

The inclusion criteria included five years of work experience in agriculture, lack of proper sunscreen application, having a minimum age of 30 years. Failure to participate in one of the educational sessions was considered to be an exclusion criterion.

2.3 Sample size

Then, 354 farmers were surveyed in terms of inclusion criteria by referring to each of these villages using convenience sampling method. Eventually, 177 farmers entered the study. These 177 farmers were randomly assigned into three groups: motivational, volitional and control. Each group consisted of 59 individuals. Given the prevalence of sunscreen use among farmers in the previous study (Babazade *et al.*, 2016), which had almost 55% had the desirable use of sunscreen, assuming that education would result in a 25% change in sunscreen use behaviors, and assuming that the first error was 5% and

the second type error was 20%, sample size was 54 individuals in each group using the below formula.

$$n = \frac{\left[Z_{1-\alpha\ 2}\sqrt{2\overline{P}(1-\overline{P})} + Z_{1-\beta}\sqrt{P_1(1-P_1)+(P_2(1-P_2)}\right]^2}{(P_1-P_2)^2}$$

Finally, the sample size was estimated at 59 individuals with a 10% drop (59 in each group).

2.4 Instruments

In this research, a multi-section questionnaire designed based on the HAPA was used to collect data. The questionnaire was self-administered. The validity of questionnaire was assessed by content validity and reliability was assessed by Cronbach's alpha coefficient. This questionnaire includes demographic information (age, sex, education, income, history of sunburn and history of using sunscreen) and motivational factors (risk perception, outcome expectation and self-efficacy), volitional factors (action planning, coping planning and coping self-efficacy and action planning) and the sunscreen use intention and the sunscreen use (behavior) are as follows:

2.4.1 Intention. Two questions were about the individual's decision to use the sunscreen and renew it ((1) I intend to use a sunscreen with a suitable SPF when I work in the sun. (2) In addition to the sunscreen use intention, when I work in the sun, I intend to renew it every two hours). The Cronbach's alpha coefficient for this part was 0.75.

2.4.2 Risk perception. There were five questions about the perceived risks of UV radiation and sunburn risks (e.g. if there is no use of sunscreen when I work in the sun, there is a chance to get freckles on my face, causing me to have unpleasant appearance). The higher values indicate a higher risk of UV exposure and sunburn, The Cronbach's alpha coefficient for this part was 0.82

2.4.3 Outcome expectation. There were four questions about the benefits of using a sunscreen, such as the use of sunscreen during working in the sun makes my skin looks younger. Using the sunscreen when I work in the sun causes a reduction in some complications such as burning and itching and sunburn on my skin. The higher scores suggest higher outcome expectation in the subjects. The Cronbach's alpha coefficient for this part was 0.89.

2.4.4 Action self-efficacy. There were three questions about the individual's belief in his ability to use sunscreen. For example, (I am sure I can use sunscreen when I work on agricultural land). The Cronbach's alpha coefficient for this part was 0.71.

2.4.5 Action planning. One question (I have a plan to use sunscreen appropriately when I work in the sun at a specific time and specific place) measures having a plan for using a sunscreen with the questions of when, where and how. The Cronbach's alpha coefficient for this part was 0.71.

2.4.6 Coping planning. Coping planning assess having a plan for using sunscreen in different conditions and it is examined by three questions. In addition to a preliminary study, the behavioral obstacles were extracted by the participants in order to set questions for this section, and according to the obstacles, questions were set up. For example, I plan to use a sunscreen properly when I work in the sun at a specific time, specific place even when I face others' ridicule. I plan to use sunscreen properly when I work in the sun at a specific time and specific place, even if I have a shortage of time. The Cronbach's alpha coefficient for this part was 0.81.

2.4.7 Coping self-efficacy. Coping self-efficacy evaluates one's belief in one's own ability to overcome behavioral obstacles. In this study, three major obstacles to sunscreen use

(distance, time constraints and gender constraints) were considered using a preliminary study. For example, I believe that regardless of the distance I can shop for sunscreen while shopping for my other needs, I believe that I can use sunscreen, despite being ridiculed by others. The Cronbach's alpha coefficient for this part was 0.81.

2.4.8 Self-monitoring. With three questions, self-monitoring a person's proper use of sunscreen at an affordable price and a higher score indicate more control over the sunscreen use. For example, I constantly monitor myself for using a sunscreen with a suitable SPF when I work in the sun. The Cronbach's alpha coefficient for this part was 0.70.

2.4.9 Behavior. There are three questions, (1) I use sunscreen every day before starting to work on the agricultural field. (2) I am renewing the sunscreen every two hours when I work in an agricultural field and in the sun. (3) I pay attention to the amount of sunscreen and its SPF when I use it). The Cronbach's alpha coefficient for this part was 0.82.

Designed questions were scored based on the Likert scale with scales of strongly disagree (1) to totally agree (4).

2.5 Interventions

In the motivational group, educational content includes the risks of UV radiation (freckles skin cancer and early aging), ways to cope with it, the properties and effectiveness of sunscreen (duration of use, SPF), encouraging people to use sunscreen when they work in the sun using lecture, question and answer technique, group discussion. Films and photographs on the comparison of two peers in both cases of the use and non-use of sunscreen were used to stimulate the motivation of individuals to use sunscreen and ultimately behavioral planning and planning to overcome behavioral obstacles were taught. To foster coping self-efficacy, encouragement by SMS was used.

In the volitional group, by briefly reviewing the dangers of UV radiation and the benefits of using sunscreen, the importance of planning and how to plan in different situations, individuals were asked to state their program regarding the time, place and how to behave and benefit from educator's and others' opinions. Then they were asked to imagine themselves in a situation where they encountered various obstacles (according to the list of extracted obstacles by individuals interviewed in the preliminary study) and express their program regarding the time, place and the way of dealing with obstacles they will likely face. Each person was asked to express his program to overcome obstacles at least in three scenarios and with respect to the similarity of the obstacles; appropriate role modeling was used to foster their coping self-efficacy.

The control group received education on skin, skin types and how to wash and clean the skin. To observe ethics at the end of the study, the pamphlet contains educational materials on the use of sunscreen and its benefits and the way of planning and the importance of planning was given at the end of study. The duration of each session was 60 min, and a total of eight sessions (two sessions per week) were held.

Group education were provided by an educator with MS degree (first author). Then, for a month, an education message was sent to the participants via the cellphone. For sending educational messages via cellphone and doing subsequent coordination, contact numbers and home addresses were received from all the subjects. Arden Sunscreen made in Iran was available to all research samples.

2.6 Follow up

At the end of the four weeks and the completion of the educational sessions, the subjects completed the study questionnaire again. Subjects were followed up for one month and again completed the study tool at the end of the month.

2.7 Statistical analysis

After collecting the data, the analysis was performed using SPSS version 19. For describing the information, the researcher used frequency indexes and the average was used. To test the hypotheses, Chi-square test, ANOVA, *T*-test and repeated measures analysis of variance were used. Before analyzing, Kolmogorov–Smirnov test was used to test the normality of the data. The significant level of Muchly test was more than 0.05. It should be noted that the three groups were homogeneous regarding the use of sunscreen and demographic characteristics such as age, sex, the experience of working in agriculture, history of sunburn and history of using sunscreen and the family history of skin cancer in first-degree relatives (see Table 1).

2.8 Ethical consideration

The present study was approved by the ethics committee of Alborz University of Medical Sciences, dated 5 August, with a code of 1397,064 and registered at the Center for Clinical Trials, with No. IRCT 20180821040846 N1.

3. Results

The mean age of the subjects was 47.78 ± 12.66 years (range: 30–79 years). The mean years of work experience were 18.67 ± 11.68 years. Most of the subjects were female (69.3%) and in the range of 30–40 years old (44.63%) and they had a diploma degree (45.2%). Most of the participants in this study had a work experience of 5–10 years (38.4%) with a history of sunburn (93.9%). The income status of most subjects (79.3%) was inappropriate and they did not use sunscreen during the study. The result of the repeated measures ANOVA with the sphericity assumption indicates that there is a significant difference in the sunscreen use behavior over time in intervention groups as well as among three groups (Table 2). Furthermore, the result of the repeated measures ANOVA with the sphericity assumption indicates that there is a significant difference in the HAPA constructs over time in intervention groups as well as among three groups (Table 3).

4. Discussion

This study was a randomized, controlled, quasi-experimental study with the aim of comparing HAPA-based educational intervention on the sunscreen use in paddy workers in northern of Iran. Paddy workers are those at risk of skin cancer high levels of daily sunlight exposure during daily work (Smit-Kronera and Brumby, 2015). The results of this study showed the effect of HAPA-based educational intervention on the sunscreen use. This finding has been confirmed by other studies using this approach (Greaves *et al.*, 2011; Hubbard *et al.*, 2018). In the review of the evidence in this field, it has been found that in most studies conducted using this approach, different interventions have been used for two phases of motivation and volition, so that in motivated individuals, interventions focused on mentioning the benefits of behaviors and dangers of unhealthy behaviors and in volition group, interventions such as action planning and self-efficacy planning has been used to overcome obstacles. That motivational interventions lead to improved behavior has often been confirmed by studies whose main axes are motivated patterns, such as the protection motivation model (Babazadeh *et al.*, 2016; Smith-Kronera and Brumbya, 2015). Although some of these studies suggest the impact of this approach on sun protection behavior changes (Babazadeh *et al.*, 2016), it is worth noting that most of these studies talk about the importance of the motivational factors in moving intention toward behavior. They believe these factors improve people's intention to prevent and control skin cancer (Moeini *et al.*, 2018; McClendon *et al.*, 2002), and they talk about planning as a mediator in the intention-behavior association (Craciun *et al.*, 2012). Rhodes and Dickau indicated that the behavioral

Table 1.
Socio-demographic characteristics of the participants

Variables	Groups	Total	Control	Volitional	Motivational	Test ID
Age		46.05 ± 11.31	47.73 ± 10.94	45.32 ± 11.25	45.10 ± 11.74	$p = 0.378$
Education	<12	64(36.16)	25(42.4)	21(35.6)	18(30.5)	$p = 0.195$
	12	80(45.2)	24(40.6)	31(52.5)	25(42.4)	
	12<	33(18.6)	10(17.0)	7(11.9)	16(27.1)	
Sex	Female	124(69.3)	36(61.1)	44(74.6)	44(74.6)	$p = 1.780$
	Male	53(29.6)	23(38.9)	15(25.4)	15(25.4)	
Experience of agricultural work		21.62 ± 11.55	19.76 ± 11.69	23.27 ± 13.62	21.55 ± 12.34	$p = 0.305$
Sunscreen use	Yes	5(2.80)	0	2(3.40)	3(5.00)	$p = 0.704$
	No	172(96.10)	59(100)	57(96.6)	56(95.00)	
History of sunburn	Yes	168(93.90)	56(95.00)	55(93.20)	57(96.60)	$p = 0.704$
	No	9(5.10)	3(5.00)	4(6.80)	2(3.40)	
Income	Appropriate	3(1.70)	1(1.70)	1(1.70)	1(1.70)	$p = 0.999$
	Medium	32(17.90)	11(18.60)	11(18.60)	10(16.90)	
	Inappropriate	142(79.30)	47(79.70)	47(79.70)	48(81.40)	

intention is necessary to behave but it is not enough (Rhodes and Dickau *et al.*, 2012). Planning increases the chance of conversion of the intention to behavior (Hagger and Luszczynska , 2014).

Given that the goal of all educational interventions is to change behavior rather than simply setting an intention, and in many cases, time shortage and other resources do not allow re-access to "people with behavioral intentions". In this study, both motivational and volitional groups were to benefit from the two phases of the educational program, the results of which showed that this interventional program promotes individuals in the volitional group and motivational group to behave to the same extent. It seems that in the motivational group, the behavioral intention has occurred before the occurrence of the behavior, and it reinforces the hypothesis that the educational program of motivation and volition phases of behavior change simultaneously in individuals in motivational group can lead them to behavior. Sometimes it is not logical to justify the separation of individuals into different groups and to consider the time to move individuals first toward the intention and then toward the behavior. Especially in high-risk groups and occupations, such as agriculture the probability of losing the opportunity for further education is very high due to lack of time or limited access, although more studies are recommended in this field.

Considering the belief that previous history of performing behavior affects the relationship between intention and behavior and weakens this relationship (Zhang *et al.*, 2019), in this study, the groups studied in terms of the history of sunburn and the use of sunscreen cream. The results of this study indicated that the groups were homogeneous according to the previous history of the use of sunscreen.

In the current study, due to the lack of time and because the study was master's thesis, there was no possibility to follow up samples for 6 months, and samples were followed only for one month.

According to the findings of this study, about 94% of the subjects had a history of sunburn, while only 5% had a history of using sunscreen. In a study conducted by Moinifard *et al.* on farmers in Western Gilan, 56.4% of farmers had a history of sunburn. By investigating the use of sunscreen in them, it was found that a higher proportion of them (8.6%) in comparison to the present study, were using sunscreen. Obviously, an increase in the use of sunscreen reduces the ratio of people with a history of sunburn. Of course, considering the minimum of five years of work experience in agriculture to enter the study, this factor has an effect on the high incidence of sunburn in this group. According to a meta-analysis study in this respect, risk perception as a primary motivator has been shown to lead to healthy behaviors (Shreen *et al.*, 2014). Obviously, the history of sunburn in people and complications such as redness, burning and itching of the skin increase people's perceptions of the risk of sun exposure and encourage them toward the use of sunscreen. In this study, HAPA-based education significantly increased the risk perception in the two groups motivational and volitional groups compared to the control group. Based on the Mauchly's Test, the difference in this variable between these three groups was significant after the intervention.

Groups	Time	Intervention			Repeated test result	
		Before M(SD)	After M(SD)	One month later M(SD)	Within group	Between group
Motivational		6.18(1.58)	8.64(3.24)	8.31(3.53)	$F = 31.39$	$F = 4685.305$
Volitional		9.74(2.31)	13.64(1.01)	11.75(3.11)	$p < 0.0001$	$p < 0.0001$
Control		11.25(2.5)	11.286(2.44)	11.81(3.01)		
Mauchly test		$p < 0.0001$				

Table 2. Mean and standard deviation of sunscreen use (before, after and one month later) in groups

Table 3.
Results of ANOVA test with repeat the score of the structures of HAPA in three periods before, after and one month after intervention in three groups

Variable	Groups	Intervention Before M(SD)	After M(SD)	One month later M(SD)	Mauchly test	Frequent analysis Within group	Between group
Risk perception	Motivational	11.5(3.37)	13.01(4.32)	12.20(4.57)	$p < 0.001$	$F = 9.38$	$F = 635.19$
	Volitional	14.96(2.97)	17.05(0.83)	16.77(1.12)		$p < 0.001$	$p < 0.001$
	Control	15.71(2.15)	16(2.98)	15.59(3.14)			
Outcome expectation	Motivational	6.32(1.96)	7.35(2.65)	12.20(4.57)	<0.001	$F = 14.27$	$F = 11.16$
	Volitional	8.54(1.77)	10.16(0.87)	16.77(1.12)		$p < 0.001$	$p < 0.001$
	Control	9.42(2.11)	9.59(1.98)	15.59(3.14)			
Action self-efficacy	Motivational	5.32(1.53)	6.71(2.32)	7.1(3.17)	<0.001	$F = 43.94$	$F = 7.76$
	Volitional	7.42(2.11)	10.18(0.86)	9.81(1.16)		$p < 0.001$	$p < 0.001$
	Control	8.61(2.13)	8.71(2.16)	9.44(2.00)			
Action planning	Motivational	2(0.74)	2.88(0.96)	2.56(0.82)	<0.007	$F = 30.37$	$F = 595.12$
	Volitional	2.84(0.63)	3.42(0.49)	3.59(0.49)		$p < 0.001$	$p < 0.001$
	Control	3.08(0.67)	3.05(0.70)	3.05(0.70)			
Coping planning	Motivational	4.86(1.40)	6.11(2.25)	6.02(2.02)	<0.001	$F = 29.71$	$F = 11.55$
	Volitional	6.93(183)	10.25(0.75)	8.69(2.14)		$p < 0.001$	$p < 0.001$
	Control	8.71(193)	9(1.90)	8.46(2.34)			
Coping self-efficacy	Motivational	4.66(1.45)	6.20(2.25)	6(1.62)	<0.001	$F = 31.93$	$F = 46.33$
	Volitional	7.10(1.96)	10.16(0.83)	8.24(2.53)		$p < 0.001$	$p < 0.001$
	Control	8.83(1.78)	9.13(1.75)	8.46(2.34)			
Self-monitoring (action control)	Motivational	6.18(1.58)	8.64(3.24)	8.24(2.53)	<0.001	$F = 32.93$	$F = 0.817$
	Volitional	9.74(2.31)	13.64(1.01)	11.75(3.00)		$p < 0.001$	$p < 0.001$
	Control	11.25(2.50)	11.18(2.44)	11.11(3.19)			

Moreover, the offered educational program increased the value expectation in the two intervention groups compared to the control group. Based on the Mauchly's Test, the difference between the three groups was also significant in this respect. Value expectation is another social recognition factor that affects people's adherence to healthy behaviors (Leventhal *et al.*, 2016). Moreover, according to the findings of this study, the educational intervention improved the individuals' self-efficacy. This factor is one of the other motivational factors that contribute to health behaviors (Jackson and Aiken, 2006).

Obviously, in this study, teaching planning affected the individuals' movement toward performing the behavior. Based on the HAPA, the intention to perform a behavior leads to performance if it is accompanied by planning (Sniehotta *et al.*, 2006).

5. Conclusion

The HAPA can be used to promote the using sunscreen behavior in farmers. Also, the results of this study showed that simultaneously, in cases such as time shortage and other cases where the possibility of re-accessing the samples is limited, the researcher used the educational program based on both phases in two groups (pre-intention and intention).

5.1 Limitations of the study

This study has been carried out in the farming seasons and it is possible that factors such as the shortage of time affect farmers' participation in the study. As far as possible, the researcher tried to overcome this limitation by prior arrangements. Other notable limitation of this study is to do it in northern Iran. Farmers in that area may have some differences in demographic characteristics (such as skin sensitivity) with farmers in other parts of Iran.

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Do schools and alcohol mix? Australian parents' perspectives

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Received 19 February 2020
Revised 8 May 2020
17 June 2020
Accepted 12 July 2020

Abstract

Purpose – Alcohol use by adults at school events and alcohol promotion through school fundraising activities is common, but little is known about secondary school parents' attitudes towards these practices. Parental attitudes may influence principals' decision-making on this topic, particularly in jurisdictions where education department guidance is limited. This study explored parents' attitudes towards the consumption or promotion of alcohol in schools or at school events.

Design/methodology/approach – Parents (n = 298) from five non-government secondary schools in Western Australia completed an online survey and provided responses relating to the promotion and availability of alcohol through their child's school.

Findings – This sample of parents were evenly divided in support of alcohol consumption or support of schools as alcohol-free zones. Parents reporting higher alcohol consumption were more supportive of alcohol promotion and use through schools, and those with higher education supported use of alcohol for school fundraising. Almost 20% of parents were neutral on several measures indicating they could be swayed by social pressure. Engaging parents is an ongoing challenge for school principals and alcohol may play a part in engagement activities. The results from this small, exploratory study suggest even engaged parents may have very differing views on alcohol use in schools.

Practical implications – Education departments are encouraged to explore these issues carefully and introduce changes incrementally to assist decision-making and minimise potential parent disengagement.

Originality/value – This paper addresses a knowledge gap about parents' attitudes towards alcohol in secondary schools. These findings can support those involved in the development of school alcohol policies.

Keywords Alcohol, Schools, Parents, Policy

Paper type Research paper

Funding: This research was funded by Healthway, the Western Australian Health Promotion Foundation (Grant 24306).

Health Education
Vol. 120 No. 3, 2020
pp. 229-245

0965-4283
DOI 10.1108/HE-02-2020-0010

Background

Despite a recent decline in alcohol consumption among adolescents internationally, a significant number of those who do drink continue to do so at levels considered likely to increase the risk of harms even among adults (NHMRC, 2009). In a 2017 survey of Australian adolescents aged 12–17 years, 23% indicated they had drunk at risky levels (five or more standard drinks on one occasion) in the last month (Guerin and White, 2018). Thirty-five percent of European 15–16 year olds report heavy episodic drinking in the past month (ESPAD, 2015). Thus, alcohol-related harm continues to be a major public health concern in Australia and internationally. Efforts to delay young people's alcohol initiation and to identify and harness the factors associated with recent declines are at the forefront of prevention efforts (Aiken *et al.*, 2018; Barry *et al.*, 2016; Pennay *et al.*, 2018). Increasing awareness among parents of alcohol-related risks and stricter alcohol-related parenting behaviours have been postulated as possible explanations for the decline (Pennay *et al.*, 2018). Studies in Denmark (De Looze *et al.*, 2014) and Finland (Raitasalo *et al.*, 2018) support the role of parents in the decline through monitoring and parenting style, but this has not been found consistently in Australian studies (Hodder *et al.*, 2018).

The influence of the social norms and role modelling to which young people are exposed is difficult to quantify but is widely accepted and can be attributed to home, school and social environmental norms and the relationships between each of these environments (Ennett *et al.*, 2008). While evidence for health-promoting schools-based interventions in reducing alcohol use is limited (Langford *et al.*, 2015; Shackleton *et al.*, 2016), investigation of potential negative influences that can occur within schools could identify targets for future intervention efforts. Alcohol use or exposure to alcohol at, or through schools is one such influence. Permitting alcohol to be used, distributed or sold by schools is likely to undermine schools' existing health messages and policies and has implications for staff duty of care. Further, adults' drinking in schools exposes children to role modelling by parents and teachers which can reinforce normative beliefs that alcohol is a necessary part of everyday activities (Munro *et al.*, 2014). Given that parental modelling has been associated with adolescent initiation of drinking and levels of alcohol use (Ryan *et al.*, 2010) limiting alcohol use in schools may be a community-wide approach to reducing alcohol use by young people.

The context of alcohol use in schools has been framed as either revenue generating (i.e. as part of school fundraising events), for ritual or celebration (i.e. at parent/staff meetings and graduation celebrations), or recreational (i.e. for parent/staff consumption at school events) (Munro *et al.*, 2014). Thus members of school communities may identify positive benefits of permitting alcohol availability, promotion and consumption under certain conditions (Munro *et al.*, 2014). With most of these alcohol use contexts associated with efforts to engage parents in school activities, it is important that policies designed to allow and/or control alcohol use do not hamper these efforts and alienate groups of parents.

Estimates of alcohol use at school events have been determined by examining data on liquor licences granted to schools across jurisdictions (Ward *et al.*, 2018). Results showed large variations, such that rates of granting of occasional liquor licences to schools were 60 times greater in some states than others. Across Australia, the requirements governing the use of alcohol at school events also vary according to policies governing the different school sectors within each of these jurisdictions (Ward *et al.*, 2018). A 2014 review of education department alcohol policies (i.e. affecting public schools) across Australia showed these varied considerably by jurisdiction in terms of clarity and requirements of the policy (Ward *et al.*, 2014). States with more restrictive education department policies tended to have lower rates of liquor licence applications by schools (Ward *et al.*, 2018). Independent and Catholic schools, while not governed by education department policies, showed similar trends in liquor licencing applications to government schools within and between states (Ward *et al.*, 2018).

In most Australian jurisdictions, decision-making about alcohol consumption at school events and the promotion of alcohol in fundraising efforts are largely the responsibility of

school principals and school councils (Ward *et al.*, 2014). Several Australian studies have reported on the attitudes and experiences of school principals regarding the promotion and adults' use of alcohol on school premises and demonstrate that adults' alcohol use at school events is common (Ward *et al.*, 2016a, 2016b). In a survey of 241 secondary school principals in New South Wales and Victoria, 36% reported at least one event where alcohol was consumed in the presence of students in the previous year, and 17% reported offering alcohol as a prize for a school fundraiser (Ward *et al.*, 2016b). The majority of events cited were year 12 graduation events (78%) and debutante balls (18%), with no sporting events cited, but a related qualitative study found that alcohol consumption also occurred at sporting, art, music and other on- and off-site events (Ward *et al.*, 2016a).

Although views differ among school principals, a majority appears to not support the consumption of alcohol at school events and some have taken action by changing policies and holding alcohol-free events. Other principals seemingly feel the pressure of an alcohol-normative school or community "culture" and have not acted on their own preferences (Ward *et al.*, 2016a). In the qualitative study of principals in Victoria, some principals made comments which were suggestive of the allowance of alcohol as part of facilitating the engagement of parents in school events (Ward *et al.*, 2016a). It is possible that principals fear losing parents from school events if alcohol is not allowed. Justification for this concern is found in comments made by parents, informing the Australian Drug Foundation (ADF) of their concerns about adults' alcohol consumption at school events. One parent explained that she had taken her complaint to the school principal but had been warned "not to make a fuss because fewer parents might attend school functions if they could not drink at them" (Munro *et al.*, 2014). This appears to counter the potential role of parents in the adolescent drinking decline, or at least identifies a group of parents who are not embracing the approaches likely to be effective in facilitating this trend.

Despite the emergence of this issue and recent calls for more consistent legislation and policy (Ward *et al.*, 2018), less is known about Australian parents' attitudes towards alcohol consumption at school events. Given parents' role in school fundraising events and their increasing governance role in Australian schools, it is important for principals and school policy-makers to have an understanding of parental attitudes to alcohol on schools sites and at school events to assist in planning for policy and decision-making (Ward *et al.*, 2015). A survey of parents of primary-school aged children (zero to 12 years) found that 60% disagreed or strongly disagreed with the practice of adults being able to purchase and consume alcohol at school fundraising events when children are present (Ward *et al.*, 2015).This significant support for policies making schools alcohol-free and enthusiasm for sustaining or progressing the decline in adolescent alcohol use, is at odds with the current level of alcohol availability and consumption at and associated with, school-events.

There is an absence of information about parents' attitudes to alcohol use in Australian secondary schools. The present study aimed to address this knowledge gap by exploring the attitudes of parents of secondary-school aged children about the promotion and use of alcohol by adults in secondary schools. We use data from a survey conducted in 2015 as part of a study to establish parents' experiences with parenting strategies effective in delaying or reducing alcohol use by their adolescent child (Shaw *et al.*, 2018).

Methods

Study design and sampling

The larger study and methods are described elsewhere (Shaw *et al.*, 2018). Parents of students in years 7 (age 13), 10 (age 15) and 12 (age 17) in five purposively-sampled non-government schools in Western Australia in July/August, 2015 (school response rate 11%) were invited to participate. All parents (or carers, however, for ease of interpretation, only "parents" are referred to in this manuscript) of students in the three year-levels who could complete a

survey in English were eligible for participation. Schools were provided with materials which were sent to parents on the researchers' behalf. The link to the parent survey was emailed and/or sent by text message (depending on the contact details provided to the school) to parents via the school after completion of the student surveys. Parents were asked to complete the survey with reference to their eldest child at the sampled school. A reminder email/text with a link to the survey was sent one week later. Schools were asked to publicise the study in school newsletters and other parent communications. All parents who completed a survey were entered into a prize draw for one of four shopping vouchers (A$100).

Ethics

Ethics approval for the study was obtained from the Human Research Ethics Committee at Edith Cowan University and the relevant school authorities. Parents gave implied consent by completing the survey.

Measures

The survey was developed specifically for our larger study (Shaw *et al.*, 2018) with items based on previously used surveys, expert review and target group input. Items related to parental expectation about drinking, use of alcohol-related parenting strategies, reports of their child's alcohol use, preferences for alcohol-related intervention delivery and attitudes to alcohol at school events. Here, we report on data relating to items measuring parents' attitudes to alcohol promotion and availability in schools (see Table 2).

Statistical analysis

Summary statistics were used to describe parent attitudes and sample characteristics. Chi-square tests were applied to test the associations between parent and family characteristics with sufficient variance (i.e. parent gender and education level; the child's gender, birth order and year level; and parent alcohol consumption – frequency of use, number of standard drinks usually consumed when drinks alcohol and frequency of consumption of five or more drinks on one occasion) and the main outcomes of interest, i.e. parental levels of agreement to 7 statements on alcohol in schools. To ensure the assumptions of the chi-square tests were met, the responses to the items were grouped into 3 categories, namely 0 = "Neither agree nor disagree"; 1 = strongly/agree; and 2 = strongly/disagree.

Although the three parent consumption variables were highly correlated, each was seen as important to investigate and hence these were analysed separately. Where multiple variables were identified in the chi-square tests as significantly associated ($p < 0.05$) with a parental attitude, a multivariable multinomial logistic regression analysis was conducted (with robust standard error estimation to account for school clustering). Thus, these models were fitted for two of the seven attitudinal statements where each of the parent consumption variables were significant as well as parent education.

Findings

A total of 298 parents of students from the five non-government schools in Perth, Western Australia completed surveys. These data represent 12% of the parents of children in the three year-levels at participating schools. Parent characteristics are summarised in Table 1. The majority of respondents were female, spoke English, were married and were post-secondary educated. Responses were evenly divided for parents of boys and girls and with children in each of the three age groups. The majority of parents reported some level of alcohol consumption, with almost 70% drinking at least fortnightly.

The percentages of parents who agreed, disagreed and did not have an opinion regarding each of the statements are presented in Table 2 and results from the chi-square tests in Table 3. Agreement with and details of the associations between the factors (i.e. demographic variables and parent alcohol consumption) and each statement based on the chi-square tests

Parent demographic variables	*n*	%
Gender (n = 298)		
Female	255	85.6
Male	43	14.4
Relationship to child (n = 298)		
Mother	253	84.9
Father	43	14.6
Other female carer	2	0.6
Age (n = 294)		
35–44 years	93	31.6
45–54 years	175	59.5
55–64 years	26	8.8
Marital status (n = 294)		
Married/de facto	259	88.1
Other	35	11.9
Recipient of health care Card (n = 294)		
Yes	43	14.6
No	251	85.4
Parent educational level (n = 294)		
Bachelors or postgraduate degree	174	59.2
Diploma, advanced diploma or trade certificate	64	21.8
<= Yr 12	50	17.0
Preferred not to say	6	2.0
Number of children caring for (n = 297)		
1	26	8.8
2	145	48.8
3	87	29.3
4+	39	10.8
Language spoken at home (n = 292)		
English only	269	92.1
English and other	23	7.9
McMaster family functioning (n = 295)		
Healthy functioning	281	95.3
Unhealthy functioning	14	4.7
Child gender (n = 298)		
Female	155	52.0
Male	143	48.0
Child's year level (n = 298)		
7	103	34.6
10	106	35.6
12	89	29.9
Child's birth order~ (n = 298)		
Eldest	148	49.7
Second eldest	91	30.5
Third eldest or younger	59	19.8
Whom child lives with (n = 298)		
Both parents	242	81.2

(*continued*)

Table 1.
Parent demographic and alcohol consumption characteristics

Parent demographic variables	*n*	%
Time split between homes	18	6.0
Lives with mother only	30	10.1
Parent's alcohol consumption		
How often drinks alcohol (n = 293)		
Never	27	9.2
Monthly or less often	64	21.8
Fortnightly or weekly	94	32.1
2 to 3 times a week	73	24.9
4 or more times a week	35	11.9
Usual number of standard drinks (n = 291)		
None	27	9.3
1–2	198	68.0
3–4	58	19.9
5 or more	8	2.7
Frequency of consumption of 5 or more drinks on one occasion (n = 292)		
Never	157	53.8
Less than monthly	89	30.5
Monthly	24	8.2
Weekly or more often	22	7.5

Table 1.

Note(s): ~ Parents responded for their eldest child at the sampled school

Attitude to alcohol in school	Agree/Strongly agree % (*n*)	Neutral % (*n*)	Disagree/Strongly disagree % (*n*)
Schools should be completely alcohol free/ Alcohol should not be consumed on school premises under any circumstances	49.8% (144)	17.6% (51)	32.5% (94)
Alcohol should only be consumed on school premises when there are no students present, e.g. amongst staff on a Friday afternoon; at parent-only evenings	58.2% (167)	11.8% (34)	30.0% (86)
Parents should be able to drink a glass of wine or beer at social events for families at the school	53.2% (148)	18.7% (54)	30.1% (87)
It is appropriate to serve alcohol to adults (including students over 18 years) at school celebrations such as the year 12 ball or graduation dinners	17.7% (51)	10.8% (31)	71.4% (205)
A parent's decision to provide alcohol for year 12 students at pre- and/or post–ball parties has nothing to do with the school	26.0% (75)	10.8% (31)	63.2% (182)
Selling alcohol to adults to drink at school social events for families is an acceptable way of raising funds for the school	40.1% (116)	18.7% (54)	41.2% (119)
Prizes which include alcohol are fine for school fund-raising events	51.9% (150)	18.0% (52)	30.1% (87)

Table 2.
Summary of responses to items on attitudes about alcohol and schools

are presented below. Given the mutually exclusive nature of the items, each one is presented separately in the results. The table of results for the multivariable multinomial models conducted for the two attitudinal variables where the parent education and the consumption variables were significant is presented in Tables 4 and 5. In both cases the significant

Table 3.
Results from chi-square tests of association between factors and items on attitudes about alcohol and schools

Attitude to alcohol in school	Child gender Chi-square (df = 2)	*p*	Parent gender Chi-square (df = 2)	*p*	Parent education Chi-square (df = 4)	*p*	Parent consumption frequency Chi-square (df = 4)	*p*	Parent consumption # std drinks Chi-square (df = 4)	*p*	Parent consumption frequency of 5+drinks Chi-square (df = 4)	*p*
Schools should be completely alcohol free/ Alcohol should not be consumed on school premises under any circumstances	0.5	0.782	0.04	0.982	3.6	0.467	*23.9*	*<0.001*	*15.9*	*0.003*	*11.0*	*0.027*
Alcohol should only be consumed on school premises when there are no students present, e.g. amongst staff on a Friday afternoon; at parent-only evenings	3.8	0.147	1.3	0.518	3.8	0.432	7.2	0.126	8.9	0.064	5.3	0.257
Parents should be able to drink a glass of wine of beer at social events for families at the school	1.4	0.506	0.2	0.908	6.3	0.179	*36.3*	*<0.001*	*22.9*	*<0.001*	*22.0*	*<0.001*

(*continued*)

Table 3.

Attitude to alcohol in school	Child gender Chi-square (df = 2)	*p*	Parent gender Chi-square (df = 2)	*p*	Parent education Chi-square (df = 4)	*p*	Parent consumption frequency Chi-square (df = 4)	*p*	Parent consumption # std drinks Chi-square (df = 4)	*p*	Parent consumption frequency of 5+drinks Chi-square (df = 4)	*p*
It is appropriate to serve alcohol to adults (including students over 18 years) at school celebrations such as the year 12 ball or graduation dinners	0.5	0.772	0.5	0.760	6.0	0.197	5.7	0.219	2.4	0.668	5.4	0.253
A parent's decision to provide alcohol for year 12 students at pre- and/or post–ball parties has nothing to do with the school	*10.9*	*0.004*	*6.5*	*0.040*	2.6	0.626	3.6	0.469	1.5	0.833	1.1	0.896
Prizes which include alcohol are fine for school fund-raising events	0.3	0.867	0.6	0.731	*11.9*	*0.018*	*26.8*	*<0.001*	*18.6*	*0.001*	*14.8*	*0.005*
Selling alcohol to adults to drink at school social events for families is an acceptable way of raising funds for the school	3.3	0.192	0.7	0.703	*13.7*	*0.009*	*31.8*	*<0.001*	*15.6*	*0.004*	*22.8*	*<0.001*

Note(s): Results with a p value < 0.05 are indicated in italics

		OR	SE	z	P	95% CI	
Model 1.1: "Prizes which include alcohol are fine for school fund-raising events" by frequency of alcohol							
S/Agree vs Neutral							
Frequency of alcohol use	Monthly or less/ never	1					
	Fortnightly/ weekly	0.9474111	0.2772249	−0.18	0.854	0.5339072	1.681168
	2X a week+	1.230465	0.3672472	0.69	0.487	0.6855164	2.208618
Parent education	Year 10/12	1					
	Trade/diploma	1.130106	0.3959659	0.35	0.727	0.5686902	2.245757
	University degree	*2.9059*	0.4114645	7.53	0.000	2.201678	3.835373
S/Disagree vs Neutral							
Frequency of alcohol use	Monthly or less/ never	1					
	Fortnightly/ weekly	0.3626706	0.2439764	−1.51	0.132	0.0970265	1.355608
	2X a week+	*0.2171345*	0.1075399	−3.08	0.002	0.0822537	0.5731946
Parent education	Year 10/12	1					
	Trade/diploma	0.4774796	0.255934	−1.38	0.168	0.1669945	1.365236
	University degree	1.490918	0.5553695	1.07	0.284	0.7184221	3.094053
S/Agree vs S/Disagree							
Frequency of alcohol use	Monthly or less/ Never	1					
	Fortnightly/ weekly	*2.612319*	1.198208	2.09	0.036	1.063165	6.418769
	2X a week+	*5.666834*	1.646526	5.97	0.000	3.206415	10.01524
Parent education	Year 10/12	1					
	Trade/diploma	*2.366815*	0.5387269	3.79	0.000	1.515014	3.697534
	University degree	1.949068	0.7953614	1.64	0.102	0.8759411	4.336897
Model 1.2: "Prizes which include alcohol are fine for school fund-raising events" by number of standard drinks							
S/Agree vs Neutral							
Number standard drinks, when drink	None/Does not drink	1					
	1–2 drinks	0.3887389	0.5472007	−0.67	0.502	0.0246309	6.135291
	3+ drinks	0.4145374	0.6197358	−0.59	0.556	0.0221316	7.764527
Parent education	Year 10/12	1					
	Trade/Diploma	1.099183	0.3485154	0.30	0.766	0.5904476	2.046249
	University degree	*2.897081*	0.3546627	8.69	0.000	2.279061	3.682691
S/Disagree vs Neutral							
Number standard drinks, when drink	None/Does not drink	1					
	1–2 drinks	*0.0836308*	0.091801	−2.26	0.024	0.0097277	0.7189922
	3+ drinks	*0.0565793*	0.068291	−2.38	0.017	0.005312	0.6026354
Parent education	Year 10/12	1					
	Trade/Diploma	0.545948	0.2835193	−1.17	0.244	0.1972919	1.510753
	University degree	1.51064	0.540403	1.15	0.249	0.7493069	3.045526

(*continued*)

Table 4. Multinomial regression results for "Prizes which include alcohol are fine for school fund-raising events"

		OR	SE	z	P	95% CI	
S/Agree vs S/Disagree							
Number standard drinks, when drink	None/Does not drink	1					
	1–2 drinks	*4.648272*	2.061698	3.46	0.001	1.948718	11.08751
	3+ drinks	*7.326662*	4.971722	2.93	0.003	1.937752	27.70219
Parent education	Year 10/12	1					
	Trade/Diploma	*2.013347*	0.4523615	3.11	0.002	1.296193	3.127287
	University degree	1.917783	0.7675166	1.63	0.104	0.8752657	4.20203
Model 1.3: "Prizes which include alcohol are fine for school fund-raising events" by frequency has 5+drinks							
S/Agree vs Neutral							
Frequency of "binge"	Never	1					
	Less than monthly	1.65619	0.4503725	1.86	0.064	0.971942	2.822148
	Monthly or more frequently	1.357188	0.4503626	0.92	0.357	0.7082418	2.60075
Parent education	Year 10/12	1					
	Trade/Diploma	1.164427	0.2988649	0.59	0.553	0.7041099	1.925679
	University degree	*3.03412*	0.3265883	10.31	0.000	2.457031	3.746752
S/Disagree vs Neutral							
Frequency of "binge"	Never	1					
	Less than monthly	0.6626961	0.4165525	−0.65	0.513	0.1933181	2.271727
	Monthly or more frequently	*0.3546575*	0.107968	−3.41	0.001	0.1952895	0.6440796
Parent education	Year 10/12	1					
	Trade/Diploma	0.6126348	0.2507213	−1.20	0.231	0.2746925	1.366333
	University degree	1.553501	0.4274441	1.60	0.109	0.9059505	2.663905
S/Agree vs S/Disagree							
Frequency of "binge"	Never	1					
	Less than monthly	2.499169	1.388357	1.65	0.099	0.8412594	7.424401
	Monthly or more frequently	*3.826757*	1.161552	4.42	0.000	2.110872	6.937448
Parent education	Year 10/12	1					
	Trade/Diploma	*1.900686*	0.3501875	3.49	0.000	1.324594	2.727332
	University degree	*1.953085*	0.5119203	2.55	0.011	1.16846	3.264588

Table 4.

Note(s): Neutral: "Neither agree or disagree". Results with a p value < 0.05 are indicated in italics

associations found in the chi-square tests were sustained and the conclusions drawn were substantively the same.

In summary, none of the factors were associated with two of the attitudinal statements; only parent and child gender were associated with the statement regarding a parent's decision to provide alcohol for year 12 students; only the parental alcohol consumption variables were

		OR	SE	z	P	95% CI	
Model 2.1: "It is appropriate to serve alcohol to adults (including students over 18 years) at school celebrations" by frequency of alcohol use							
S/Agree vs Neutral							
Frequency of alcohol use	Monthly or less/ Never	1					
	Fortnightly/ weekly	1.548439	0.4980563	1.36	0.174	0.8243367	2.908597
	2X a week+	*2.353242*	0.3623622	5.56	0.000	1.740183	3.182279
Parent education	Year 10/12	1					
	Trade/Diploma	1.200045	0.3383039	0.65	0.518	0.6906151	2.085255
	University degree	*2.067476*	0.5302772	2.83	0.005	1.250604	3.417915
S/Disagree vs Neutral							
Frequency of alcohol use	Monthly or less/ Never	1					
	Fortnightly/ weekly	*0.3270035*	0.1656261	−2.21	0.027	0.1211774	0.8824354
	2X a week+	*0.3599574*	0.0967507	−3.80	0.000	0.2125504	0.6095934
Parent education	Year 10/12	1					
	Trade/Diploma	1.023181	0.4462707	0.05	0.958	0.4352038	2.40554
	University degree	0.6480167	0.3655942	−0.77	0.442	0.2144669	1.957997
S/Agree vs S/Disagree							
Frequency of alcohol use	Monthly or less/ Never	1					
	Fortnightly/ weekly	*4.735237*	2.607002	2.82	0.005	1.609569	13.93073
	2X a week+	*6.537558*	1.023852	11.99	0.000	4.809592	8.886339
Parent education	Year 10/12	1					
	Trade/Diploma	1.172857	0.2567859	0.73	0.466	0.7636291	1.801389
	University degree	3.190468	2.521546	1.47	0.142	0.677825	715.01726
Model 2.2: "It is appropriate to serve alcohol to adults (including students over 18 years) at school celebrations" by Number of standard drinks							
S/Agree vs Neutral							
Number standard drinks, when drink	None/Does not drink	1					
	1–2 drinks	3.246525	2.127592	1.80	0.072	0.898646	11.72867
	3+ drinks	3.316647	2.419289	1.64	0.100	0.7939633	13.85473
Parent education	Year 10/12	1					
	Trade/Diploma	1.147605	0.3192429	0.49	0.621	0.6652787	1.979617
	University degree	*2.143046*	0.5497626	2.97	0.003	1.296194	3.543178
S/Disagree vs Neutral							
Number standard drinks, when drink	None/Does not drink	1					
	1–2 drinks	0.4929205	0.2443807	−1.43	0.154	0.1865379	1.302526
	3+ drinks	*0.2791153*	0.0725071	−4.91	0.000	0.1677501	0.4644129
Parent education	Year 10/12	1					
	Trade/Diploma	1.152283	0.4766527	0.34	0.732	0.5122142	2.592189

(*continued*)

Table 5. Multinomial regression results for "It is appropriate to serve alcohol to adults (including students over 18 years) at school celebrations"

		OR	SE	z	P	95% CI	
	University degree	0.7742866	0.3650673	−0.54	0.587	0.3073052	1.950893
S/Agree vs S/Disagree							
Number standard drinks, when drink	None/Does not drink	1					
	1–2 drinks	*6.586306*	2.548719	4.87	0.000	3.084966	14.06156
	3+ drinks	*11.88272*	8.127942	3.62	0.000	3.10944	45.40977
Parent education	Year 10/12	1					
	Trade/Diploma	0.9959402	0.2887958	−0.01	0.989	0.5641672	1.758161
	University degree	2.767768	1.996552	1.41	0.158	0.6731452	11.38022
Model 2.3: "It is appropriate to serve alcohol to adults (including students over 18 years) at school celebrations" by Frequency has 5+drinks							
S/Agree vs Neutral							
Frequency of "binge"	Never	1					
	Less than monthly	1.811631	0.5984173	1.80	0.072	0.9482025	3.461293
	Monthly or more frequently	*2.5458*	0.8526191	2.79	0.005	1.320525	4.90797
Parent education	Year 10/12	1					
	Trade/Diploma	1.172716	0.3494919	0.53	0.593	0.6539109	2.103135
	University degree	*2.292676*	0.3316533	5.74	0.000	1.726672	3.044217
S/Disagree vs Neutral							
Frequency of "binge"	Never	1					
	Less than monthly	0.669841	0.2553431	−1.05	0.293	0.3173175	1.414
	Monthly or more frequently	*0.434093*	0.1559752	−2.32	0.020	0.2146521	0.8778703
Parent education	Year 10/12	1					
	Trade/Diploma	1.184526	0.4504752	0.45	0.656	0.5621244	2.496069
	University degree	0.7649363	0.3410843	−0.60	0.548	0.3192093	1.833053
S/Agree vs S/Disagree							
Frequency of "binge"	Never	1					
	Less than monthly	*2.704568*	1.22577	2.20	0.028	1.112537	6.574781
	Monthly or more frequently	*5.864642*	1.057441	9.81	0.000	4.118729	8.35064
Parent education	Year 10/12	1					
	Trade/Diploma	0.9900302	0.2667397	−0.04	0.970	0.5838655	1.678743
	University degree	2.997212	1.764102	1.86	0.062	0.9456192	9.499889

Table 5.

Note(s): Neutral: "Neither agree or disagree". Results with a p value < 0.05 are indicated in italics

associated with two statements; and parent consumption and parent education were associated with the two items on parental attitudes to the use of alcohol for fundraising. The child's birth order and their year level were not associated with any parental attitudes (Table 3).

Overall, almost half agreed/strongly agreed that schools should be completely alcohol free, but one-third disagreed/strongly disagreed with this statement. Parent attitude to schools being completely alcohol free was significantly associated with parent alcohol consumption, i.e. parents' drinking frequency, typical number of standard drinks and frequency of drinking five or more standard drinks on an occasion. Parents who reported consuming alcohol less frequently and at lower levels were more likely to agree with the statement that there should be no alcohol in schools than parents who drank alcohol more often and at higher levels. For example, 68.9% of those who drank monthly or less often agreed with this statement compared with 34.0% of those who drank twice a week or more often.

Significant associations were found between agreeing with the statement "parents should be able to drink a glass of wine or beer at social events for families at the school" and each of the parental consumption variables, with parents who drank alcohol, who consumed more standard drinks when they did drink and more often drank at risky levels more likely to be supportive of parents' rights to drink alcohol at family social events at school.

The only significant associations with the statement "a parent's decision to provide alcohol for Year 12 students at pre- and/or post–ball parties has nothing to do with the school" were both parent and child gender, with fewer female than male parents disagreeing (i.e. being supportive of the school having a say) and no fathers being neutral for this item. Parents responding to the survey in relation to boys (and hence likely thinking of the school's role relative to their son, even if they also had a daughter as some may have) were more likely to disagree.

An association was observed between the variable "Selling alcohol to adults to drink at school social events as an acceptable way of raising funds for the school" and parent education, whereby more highly educated parents were more likely to agree with this statement. Further, significant associations were found between agreeing with this statement and all three parental alcohol consumption measures. These associations remained significant in the multivariable models including both parent education and parent consumption variables (see Table 4).

An association was observed between the variable "Prizes which include alcohol are fine for school fundraising events" and parent education, whereby more highly educated parents were more likely to agree with this statement. Further, significant associations between agreeing with this statement and each of the consumption measures were observed, with heavier and more frequent drinkers more likely to agree. These associations remained significant in the multivariable models including parent education (See Table 5).

Discussion and interpretation

On many measures, this sample of parents was fairly evenly divided in support of alcohol consumption or support of schools as alcohol-free zones. For example, apart from issues of alcohol at and after graduation balls, between 30% and 53% of the parents indicated permissive attitudes to alcohol in schools while roughly the same range in percentages indicated restrictive attitudes (i.e. between 30% and 58%). Roughly half of parents agreed/strongly agreed and a third disagreed/strongly disagreed that schools should be alcohol free and that alcohol consumption should only occur at school when children are not present. At the same time about half were supportive of parents being able to drink at school events and that prizes including alcohol are fine for school fundraising events. Parents were less accepting of the consumption of alcohol at year 12 graduation celebrations or post–ball parties and were supportive of the involvement of schools in these decisions. More frequent and higher volumes of drinking among parents were associated with higher acceptability of both adult drinking at school events and the use of alcohol in fundraising efforts. Higher

parental education was associated with greater acceptance of the use of alcohol for fundraising purposes, but not any of the other attitudes.

Patterns of responses between the attitudinal items are indicative of the complex nature of this topic. For example, while roughly half of the respondents agreed that schools should be completely alcohol free, roughly half of those parents also agreed that alcohol should only be consumed on school premises when there are no students present and a third agreed that parents should be able to drink a glass of wine or beer at social events at the school. It is likely that the first item was viewed as an overarching statement and was answered with the child in mind, while the latter items relate more specifically to parents themselves. It seems that when presented with the more specific scenarios relating to their own freedom to drink alcohol, parents were less inclined to agree that they should not be able to drink.

This study is limited by a small sample size and restriction to non-government schools. Only 11% of invited schools participated and only 12% of eligible parents completed the survey. This recruitment rate is lower than in some previous studies for parents and schools (Aiken *et al.*, 2017; Gilligan *et al.*, 2014b) and may reflect increasing difficulties in recruiting parents into health-related (Hughes *et al.*, 2015) and school-based (Schilpzand *et al.*, 2015) research. The budget in the present study limited our capacity to adopt active follow-up approaches and also meant that limited incentives could be offered to encourage participation. As is often the case in research with parents (Aiken *et al.*, 2017), there was an over-representation of mothers in the sample. It also seems that education level and family structure are not representative of the overall Australian population (Australian Bureau of Statistics, 2018), with a higher representation of educated parents and dual parent families and an under-representation of cultural minority groups. Hence, the sample represents a homogenous group of parents, who are likely more supportive of research studies. Importantly, however, this group of parents also represents the minority more likely to engage with their child's school and therefore could be regarded as more inclined to adopt recommended alcohol-related parenting approaches and monitoring. Therefore, while the sample may not be representative, it provides a snapshot of the attitudes of an important target group of parents, particularly given the limited research in this area. Further research with representative samples of parents of high school aged children across several jurisdictions is recommended to build on these exploratory findings.

The nature of this sample of parents, itself represents a challenge for schools and principals. If the response rate of parents to this survey is reflective of parent engagement in schools, the divided nature of the parent group could have substantial impact. With roughly half of the engaged parents likely to be challenged by a school's decision to change policy in either direction, schools risk further distancing parents from involvement in their child's education.

The lack of differences between year levels may be due to the fact that most of the parents cared for multiple children, thus those in each year level have had different experiences with older and younger children. For example, the attitudes of some parents may have been shaped by earlier experiences with older children, and for others, the fear of influence over younger children may have been a factor.

Importantly, a substantial proportion of the parents (11–19%) selected "neither agree nor disagree" for several measures which suggests that these parents could be swayed by the social and cultural norms of their school and parent group (Gilligan *et al.*, 2014a, b). At both ends of the spectrum from these "neutral" parents, however, were relatively strongly-opinionated groups advocating either for their right to drink, or for the protection of children. With this discordance in parent attitudes observed in the fairly homogenous group of parents in this study sample, it is reasonable to assume that within the broader parent population parental attitudes would be equally or even more diverse.

Evidence has shown that a vocal minority of parents can initiate action. For example, after media reports highlighting negative issues associated with adult alcohol use in schools, seven

parents lodged complaints with the Alcohol and Drug Foundation in 2012/ 2013 (Munro *et al.*, 2014). Subsequently, the Public Schools Association of Western Australia banned alcohol use at its sporting events. In the case of the group on the other side of the debate, however, their opinions and opposition to any action on adult drinking in schools is likely to be expressed differently; potentially through disengagement with schools or school events. Though it is recognised as a critical element of successful schooling, schools and principals often struggle to engage parents in their children's learning and social development through school activities (Wang and Sheikh-Khalil, 2014; Povey *et al.*, 2016). It is possible that current school policies and practices are not in keeping with the desires of most parents, but the findings of this study suggest that such a goal may be unattainable without a shift in social norms to increase parents' support for restrictions to be implemented.

Parent education level was associated with some variables, with more highly-educated parents more accepting of selling alcohol at school events to raise funds for the school and of the use of alcohol as prizes in fundraising activities. This was not unexpected given consistent evidence that higher socioeconomic status (SES) and education are associated with higher alcohol consumption, but those in lower SES groups bear more of the burden of alcohol-related consequences (Collins, 2016; Huckle *et al.*, 2010). Similarly, both parent and child gender were associated with agreement with the concept that schools have a role to play in decisions about providing alcohol at pre- and/or post–ball parties, with fathers and parents responding for boys more likely to support a role for the school. It is possible that parents perceive the role of the school differently for boys and girls, but without more information about the gender of other children in the family and the family structure, any efforts to explain this would be mere speculation. This does, however, warrant further investigation.

There is a discrepancy between the permissive nature of adult drinking at school events and attitudes towards "serving alcohol to adults that might include students who are over 18 years at school celebrations", with the latter being far less supported by the parents in this study. Given the frequency at which such alcohol consumption occurs however (Ward *et al.*, 2016a, 2016b), it could be that this response is particularly negative due to the stipulation in the question, that over 18-year-old students might also be included. Again, parents appear to be less supportive when faced with the reality of their own child drinking. This finding is somewhat at odds with previous studies in which year 12 graduation celebrations have emerged as the most common school-related context in which adults do drink alcohol (Ward *et al.*, 2016b). Further, Munro *et al.* have discussed the challenge of managing such celebrations where parents who are present could give permission for students under 18 years to drink, but those students who are not accompanied by parents require adult supervision (Munro *et al.*, 2014).

Conclusions

This study provides an initial exploration of the attitudes of parents to alcohol in secondary schools. While the non-representative sample limits the generalisability of the findings, this research addresses a gap in the literature and a topic on which the level of guidance provided to schools is variable across Australia. Reduction in the availability of alcohol through schools and at school events is a potential target for sustaining the trend of reduced alcohol consumption among adolescents. Schools need to consider their policies regarding adult alcohol use at school events in light of evidence regarding the impact of role-modelling and socially-normative behaviour on children. This issue appears to be one on which parent opinion varies, even within a relatively homogenous sample such as that in this study. Decision-making which attempts to accommodate the desires and beliefs of parents is likely to be problematic for principals and other school-level decision makers, particularly given the limited guidance provided by education authorities in some jurisdictions. Principals and education departments are encouraged to explore these issues carefully to ensure parents with differing points of view remain engaged. If education departments take a more active

role in directing schools' management of alcohol, pressure could be alleviated from individual principals and parents could potentially receive clear and consistent messages that support the non-use of alcohol by young people.

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