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BENCHMARKING ALCOHOL LITERACY: A MULTI COUNTRY STUDY[5]

Alcohol is a harmful drug putting both the individual and others at risk, all at a great cost to society. Considerable debate surrounds alcohol marketing practices with some advocating for more government control on the marketing of alcohol to curb excessive alcohol consumption. An opposing view exists with others advocating for an individual's right to choose, with lobbyists making specific reference to informed adults. This paper contends this debate may be premature as adults are not adequately informed about alcohol. Data was collected from more than 1,500 respondents in Australia, Canada and Poland to provide an initial benchmark for alcohol literacy. The results of this study indicate that adults are not sufficiently informed about alcohol, and the effects of alcohol on their health. Our research indicates that adult alcohol literacy must first be improved to ensure that informed choices can be made. In an era of social responsibility alcohol stakeholders are obligated to act. In the absence of fully informed adults government must act immediately to prevent alcohol related harm in the short term and to ensure that adults are alcohol literate to encourage moderate drinking in the long term. Public policy implications are outlined.

Keywords: alcohol literacy, social marketing, alcohol consumption, marketing research

1. INTRODUCTION

Alcohol abuse and excessive alcohol consumption remain one the most pressing social problems in many different countries across the globe [1]. According to the World Health Organization [2], alcohol is a significant contributor to the global burden of disease and is the fifth leading risk factor for premature deaths and disabilities in the world. WHO estimates that nearly 1 million or 3% of Polish people are dependent on alcohol and an additional 3 million abuse alcohol, 20% of Poles binge drink, and 31% of Polish 15-year-olds can be classified as binge drinkers [3]. The data for Canada and Australia are equally worrying. It is estimated that 10% of the Canadian population are dependent on alcohol, 20% are heavy episodic drinkers, and 29% of 15-years-olds binge drink [4]. Finally, it was found that 6.5% of the total sample in research conducted in Australia met criteria for alcohol use disorder, the alcohol consumption patterns of a further 13% of Australians and

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21% of 14-19-years-olds can be described as risky with many drinking at high risk levels at least once a month [5].

In regards to alcohol consumption, people are often faced with conflicting guidelines making it difficult for a person to understand what is OK and what is not. Consider this recent example. On October 7, 2010 the media reported that it is OK for pregnant women to drink alcohol. This release was based on a study published by Kelly et al. [6] that drew on data from 11,513 children born in the UK between September 2000 and January 2002.The study found children born to light drinkers were 30 per cent less likely to have behavioural problems than children whose mothers stayed away from alcohol throughout their pregnancy. Further, the study concluded that boys and girls born to light drinkers had higher cognitive test scores compared with those born to mothers who did not drink during pregnancy. This study, which concludes that women can safely drink a 175ml glass of wine per week, conflicts with World Health Organization, Polish State Agency for Prevention of Alcohol-Related Problems, and Australian National Health and Medical Research Council guidelines that recommend pregnant women should abstain from drinking alcohol, which equals zero drinks per week.

Confused messages are not the only issue that people are faced with. As noted by Hoek and Jones [14], lobbyists for the tobacco, alcohol and fast food industries claim that decisions to consume their products are a matter of personal choice with decisions made by informed adults. Yet, there are studies which provide evidence suggesting people have poor health literacy [8,9,10], and more specifically that people are not adequately informed about alcohol [11,12]. If consumers are unable to understand health messages or do not possess sufficient knowledge relating to alcohol, it is not possible to expect them to be able to make informed decisions including abstaining from alcohol or drinking alcohol in moderation.

Various forms exist to influence alcohol drinking, including education, social marketing and public policy. However, to inform education, social marketing and public policy we need to better understand alcohol literacy. Due to different consumption patterns and styles in different countries [13,1,14], consideration of alcohol literacy across three different countries can provide additional insights. Specifically, we need to understand what people currently know and understand about alcohol, and hence what they do not know. There are many contextual differences making the study of alcohol across countries problematic owing to different restrictions, consumer preferences, marketing practices and drinking cultures. Consideration of alcohol literacy requires that we use the same set of measures, some of which are contextualised, across countries. This paper seeks to benchmark alcohol literacy in three countries, namely Australia, Canada and Poland.

2. LITERATURE REVIEW

2.1 Health literacy

A considerable amount of research has been undertaken to understand health literacy. Yet there is still no agreement in the relevant literature as to what health literacy encompasses. Berkman et al.'s [15] literature review highlighted four main types of definitions of health literacy: *individual static* definitions, *individual dynamic* definitions, *individual/system* definitions and *public health* definitions. So called *individual static* approaches to health literacy appear to be the most common. One example of an

individual static type of definition is the WHO's description of health literacy as 'the cognitive and social skills, which determine the motivation and ability of individuals to gain access to, understand and use information in ways that promote and maintain good health' [16]. *Individual dynamic* approaches to health literacy characterise health literacy not as already possessed skills and abilities, but more as a pro-active learning process, which may be context-specific and hence not always dependent on the number of years of completed education or general reading ability [17]. For example, Zarcadoolas et al. [18] state that health literacy is '*the wide range of skills and competencies that people develop to seek out, comprehend, evaluate, and use health information and concepts to make informed choices, reduce health risks, and increase quality of life.'*

The overwhelming majority of research into health literacy has been conducted in the North American context, in particular in the United States [19,20] where the associations between literacy and health outcomes have been the main focus. Crucially, however, several authors acknowledge that poor progress has been made to date in making individuals' informed about their own health [21,22]. According to the National Adults Literacy Survey (NALS), an estimated 90 million adults in the United States, which is almost 50% of the adult American population, have limited literacy skills [23]. Low health literacy leads to inadequate comprehension of received medical information, inability to precisely follow the recommended treatment, more frequent hospital admissions and increased mortality rates [24]. Poor health literacy costs the United States an estimated $100-$236 billion every year [25]. So far, in assessing health literacy in the US two kinds of instruments have been frequently used: the Test of Functional Health Literacy in Adults (TOFHLA) [26] and the Rapid Estimate of Adult Literacy in Medicine (REALM) [27].

The issue of health literacy has been explored among different social groups, for example: adults [27], young adults [28], elderly people [20,25,29,30] groups speaking different languages within the same country [31,32,33], adults with addiction [27,35,36], patients with specific illnesses [37,38], and practitioners and professionals from medical and literacy sectors [9,19,24]. McIntyre et al.'s [19] research emphasised the importance of health literacy as a much better predictor of health status than age, income, race, ethnicity, employment status, or educational level. However, other authors have found no relationship between variables such as age, level of education and self-reported literacy skills, and the level of health literacy [27,32].

Taken together the body of research on health literacy suggests that people with limited health literacy have a significantly worse health status [36,39,40]. Moreover, people with poor literacy are more likely to indulge in risky behaviours [8, 40]. For example, Lincoln et al.'s [35] work among adults with addiction showed that 'low literacy would be associated with higher addiction severity, higher levels of depressive symptoms, and worse mental health functioning compared with those with higher literacy in adults with alcohol and drug dependence'. It appears that alcohol literacy, defined here as the *skills and competencies that people develop to seek out, to comprehend, evaluate, and use alcohol information and concepts to make informed alcohol choices'* is related to alcohol consumption. We next summarise related alcohol literacy literature.

2.2 Alcohol literacy

Despite the social, economic and cultural importance of responsible alcohol consumption, alcohol literacy has received limited research attention. Prior research

suggests that people are not sufficiently informed about the short and long term risks associated with alcohol consumption [12]. The Rundle-Thiele [11,12] studies noted that one in four Australian adults' are not armed with sufficient knowledge to make informed decisions about the amount of alcohol they are consuming, suggesting there are many knowledge gaps. These findings are consistent with research conducted in the early 1990s by Carruthers and Binns [42] and also by Lader and Goddard [43]. The knowledge of standard drinks in popular alcoholic beverages such as a glass of wine or bottle of beer is low and has remained low for decades [11,12,43,44,45,46]. Further, there is evidence suggesting 'there is a strong tendency to underestimate the alcoholic content of beverages' [47].

In terms of negative consequences of alcohol consumption on one's health, Rundle-Thiele [11] identified several different short- and long-term negative consequences. Other authors investigated a wide range of negative social consequences of high-risk alcohol consumption, such us: difficulties with personal relationships, work, police or other authorities and various antisocial behaviours [48,49,50]. In general, two types of studies into various negative consequences of alcohol consumption can be distinguished. Some studies employ a more holistic approach in an attempt to investigate a wide range of negative consequences [11,50,51.52,53] while other studies focus on in-depth exploration of some specific health consequences, for example alcohol addiction (Chrostek Maj et al. 2005), and specific risk-taking behaviours, such us: alcohol related traffic accidents (Murry 1991) and alcohol influenced sexual behaviour and violence [56].

Taken together the body of research on alcohol consumption behaviours and alcohol literacy suggest that high and appropriate levels of alcohol literacy are a prerequisite for moderate alcohol consumption. Aseltine et al. [40] argued that 'lack of awareness or underestimation of alcohol problems may pose significant barriers to changing at-risk or harmful drinking patterns'. Further, Hasking et al. [8] found that the chances of having misused alcohol were higher among students with lower literacy levels than among students with higher literacy levels. The focal point within alcohol literacy seems to be a question of 'if and to what extent improving appropriate alcohol literacy among different social groups may influence their alcohol consumption, reducing the scale and scope its negative consequences'. Some authors argue that the effects of delivering appropriate alcohol literacy are limited [10]. Others emphasise that education/information, used as the only prevention method, failed to curb high-risk drinking behaviours because of complexity of motives and attitudes in alcohol consumption behaviours [57,58]. Much better results in moderating high-risk alcohol consumption are achieved through multi-component interventions [59], where a combination of information-based approaches and interactive activities is used [10].

Whilst some authors dispute the importance of fully informing people there is significant evidence linking higher levels of alcohol literacy among specific groups of people with lower alcohol consumption levels. For example, Rhodes et al. [60] suggested that students who are aware of alcohol policy on campus and have alcohol health risk information binge drink less in comparison to students who are not aware of existence of these policies and information on the campus. In the context of pregnancy Blume et al. [31] also provide support for alcohol literacy noting that women whose alcohol literacy was higher consumed lower amounts of alcohol during pregnancy.

3. METHOD

Convenience samples were used to collect data using a combination of online and offline data collection with a minimum sample size of 400 required for each country analysed in this study. An online panel was used in Canada with an effective response rate of 49%. Stratified convenience samples were used in Australia and Poland. Surveys were distributed online and offline, to a combination of friends, relatives, work colleagues, students on campus and other persons in Australia and Poland. A total of 582 surveys were collected in Australia, 515 in Canada and 417 in Poland.

A survey containing three sections was developed to understand how informed people are about alcohol. The first section contained 19, eight-point items where 8 was 'don't know' (see Table 1). A don't know category was provided to avoid forcing a response. Some measures captured consumer attitudes towards the relationships between alcohol consumption and various health states and behavioural states (e.g. violence and inhibitions). Measures were selected after consulting key health bodies [2], literature considering health knowledge [31] along with country government drinking guidelines [61,62]. Further, items were developed to measure consumer attitudes towards responsible alcohol consumption. Items seeking consumer opinions on the marketing of alcohol were also included in the survey. Finally, items seeking opinions on the impact of alcohol on society and the marketing of specific beverages were captured with the beverages chosen differing by country. Nineteen items were administered in all three countries to permit comparison. Responses indicating 'don't know' were converted to missing data, thus eliminating this category from one-way analysis of variance.

The second section contained knowledge questions to assess what people know about Government recommended alcohol consumption levels, drink driving limits and the number of standard drinks contained in popular alcoholic beverages (wine, beer and spirits). Specifically, respondents were asked to nominate recommended drinking levels for men, women, pregnant women and minors, and the number of standard drinks contained in different alcoholic beverages (a glass of wine, a bottle of wine, a bottle of light beer, a bottle of full strength beer and a serve of spirits). Respondents were also asked to nominate the drink drive limit for adults, the number of standard drinks that men and women's can process in the first and subsequent hours to stay under the legal drink drive limit. The total number of questions was dependent on the countries drinking guidelines and varied between 12 and 16 knowledge questions. Answers were considered to be correct and were awarded a score of 1 if the respondent provided a correct answer or an answer that was lower than the correct answer. Scores were summed to provide an alcohol knowledge test score. The percentage of total questions correct was calculated and the percentages were used in subsequent analysis enabling comparison of country data.

Following calculation of the knowledge test scores data was analysed using one-way analysis of variance to understand whether alcohol knowledge levels and alcohol perceptions varied according to demographic groups.

4. RESULTS AND DISCUSSION

A one-way analysis of variance (ANOVA) was calculated on participants' perceptions and alcohol knowledge test scores to ascertain how informed people are about alcohol and the effect of alcohol on individual health and consequences of alcohol misuse for society.

Table 1: Alcohol perceptions by country

Item	Australia	Canada	Poland	Sig
Binge drinking can lead to an increased incidence of violence	6.1	6.1	6.2	n.s.
High alcohol consumption increases the risk of heart disease	5.9	5.8	5.7	n.s.
I am informed about the effects of alcohol consumption	5.7	6.0	6.2	p<0.001
1 in X people in the [country] are dependent on alcohol	5.6	5.7	5.1	p<0.001
I enjoy consuming alcohol responsibly	5.6	5.9	6.1	p<0.001
Alcohol is a depressant drug	5.5	5.6	4.7	p<0.001
Low alcohol consumption may offer some protective health effects	5.3	5.2	4.5	p<0.001
The estimated economic cost of binge drinking in [the country] totals [cost to country] each year.	5.3	5.6	5.0	p<0.001
High alcohol consumption increases the risk of stroke	5.2	4.6	4.1	p<0.001
[country specific brand a] has been designed to attract underage drinkers	4.9	4.1	4.0	p<0.001
In low quantities, alcohol causes people to become less inhibited	4.8	4.6	4.7	n.s.
[country specific brand b] has been designed to attract underage drinkers	4.5	3.9	3.6	p<0.001
Alcohol ads encourage irresponsible drinking	4.3	3.7	4.5	p<0.001
High alcohol consumption increases the risk of throat cancer	4.3	3.5	4.5	p<0.001
Moderate alcohol consumption may offer some protective health effects	4.1	4.4	4.3	p=0.03
Marketers encourage consumers to drink alcohol responsibly	4.0	5.1	3.5	p<0.001
Drinking alcohol increases the risk of breast cancer among females	3.6	3.7	3.6	n.s.
In all cases, alcohol is enjoyed responsibly by informed adults	3.3	2.5	3.3	p<0.001
A unit of alcohol is the amount the average body can process in one hour	2.8	5.2	4.1	p<0.001
Test score (percent correct) for alcohol knowledge test	76%	80%	75%	p<0.001

n.s. = non-significant

A total of nineteen perceptions relating to alcohol, the marketing of alcohol, the effect of alcohol on the body and the impact of alcohol abuse on society were analysed using a one-way analysis of variance. Significant differences between countries were observed for fifteen of the nineteen variables. Survey respondents in all three countries surveyed strongly agreed that binge drinking leads to increases in violence and that high alcohol consumption increases the risk of heart disease. Respondents were not aware that high levels of alcohol consumption can increase the risk of throat and breast cancers.

The results of this research suggest that asking respondents to reflect on the behaviour of others may offer more realistic insights into behaviour surrounding alcohol. In this study, respondents feel that alcohol is not always enjoyed responsibly by informed adults yet they indicate they were fully informed about alcohol. However, the strength of agreement varied with Australians agreeing (M = 5.7, SD = 1.3) they were fully informed while Canadians (M = 6.0, SD = 1.4), and Poles (M = 6.2, SD = 1.4) strongly agreed they were fully informed. Further, respondents indicated they enjoy consuming alcohol responsibly. Again the strength of agreement varied with Poles (M = 6.1, SD = 1.6) agreeing more strongly than Canadians (M = 5.9, SD = 1.4) and Australians (M = 5.6, SD = 1.7). Adult perceptions of their consumption must be considered in light of their knowledge surrounding alcohol, as many may not be aware they are consuming alcohol beyond the limits recommended by government or know enough about standard drinks. Alcohol knowledge was next explored to understand just how much adults knew about alcohol.

A one-way analysis of variance (ANOVA) was calculated on adults' alcohol knowledge test scores to ascertain if alcohol knowledge varied by country. Canadians (M = 79.7, SD = 13.9) knew more about alcohol than Australians (M = 76.4, SD = 15.0), and Poles (M = 70.0, SD = 19.7). Of note, on average adults got between 20 and 25% of questions relating to alcohol wrong suggesting they are not fully informed about alcohol. The results of this study are consistent with prior alcohol knowledge studies who also noted knowledge gaps [42,43]. Inspection of the knowledge questions indicate that a large proportion of adults are not able to correctly state, the number of standard drinks in a glass of wine, or a bottle of full strength beer. Some adults are unable to correctly specify factors such as the number of standard drinks to safely drink and drive, daily drinking guidelines specified by national health bodies and the legal blood alcohol limit for adults.

5. CONCLUSIONS

Data was collected from more than 1,500 respondents in Australia, Canada and Poland to provide an initial benchmark for alcohol literacy. The results of this study indicate that adults are not sufficiently informed about alcohol, and the effects of alcohol on their health. Adults were getting 20-25% of questions on standard drinks, legal drink drive limit and recommended daily drinking amounts wrong. Taken together, the results of this study suggest that adults in Australia, Canada and Poland are not alcohol literate.

Considerable debate surrounds alcohol marketing practices with some advocating for more government control on the marketing of alcohol to curb excessive alcohol consumption. Opposing views exist with others advocating for an individual’s right to choose, with lobbyists and academics promoting free choice making specific reference to informed adults. The results of this research indicate that adult alcohol literacy must first be improved to ensure that informed choices can be made. In an era of social

responsibility key alcohol stakeholders are obligated to act. In the absence of fully informed adults governments have a responsibility to act immediately to ensure that adults are alcohol literate. This paper contends that any debate surrounding the marketing of alcohol is premature as adults are not adequately informed about alcohol and as such are incapable of making informed choices.

5.1 Limitations

This paper is limited to convenience samples where respondents were required to answer between twelve and fourteen questions relating to alcohol and nineteen perception questions. This was not an exhaustive list and our understanding of adult knowledge is limited to this list and to the convenience samples. This paper did not examine actual or self-reported behaviour and as such the relationship between alcohol knowledge and behaviour remains underexplored, representing an opportunity for future research.

5.2 Future research

Further research is recommended to extend our understanding of adult alcohol knowledge beyond the samples and questions presented here. To overcome the convenience sample limitation a larger, more representative sample is recommended. Further opportunities arise for future research. Specifically, the results of this study indicate that approximately one in five Australian adults is unaware that the number of standard drinks is displayed on alcoholic beverages. Future research is required to test standard drink labelling to understand the best format to gain awareness of standard drink information. Further, research can be conducted to understand how information can best be delivered on alcohol packaging to increase alcohol literacy.

A continued research focus is required in order to understand the most effective way to increase knowledge. In Australia, the need to educate society about alcohol is acknowledged at both state and national levels [63,64]. Rothschild [65] states that "*education"* refers to messages of any type that attempt to inform and/or persuade a target to behave voluntarily in a particular manner but do not provide, on their own, direct and/or immediate reward or punishment (e.g., "Quitting isn't easy-keep trying," "Just don't do it," "Eat five fruits and vegetables per day"). Education measures seek to teach and create awareness. In a systematic review Stead *et al.* [66] reviewed the effectiveness of education based interventions in influencing individual behaviour change for alcohol, drugs and tobacco. Their review identified a total of 15 alcohol prevention interventions. The results of the review were that eight interventions reported some significant short term positive effects, four reported significant medium term (1-2 year) effects and two reported significant impacts over the longer term (more than 2 years). This is robust evidence that building alcohol literacy through education has a role to play in lowering alcohol consumption in both the short and longer term. Gardner's [67] theory of multiple intelligences suggests that individuals possess numerous mental representations and intellectual languages, and that together these affect how one receives, retains, manipulates and applies information. Research is required to understand the knowledge delivery formats (e.g. graphic based knowledge delivery or video based delivery) that would yield higher alcohol literacy.

Alcohol literacy has received limited research attention to date and this gap in the literature provides an excellent opportunity for research to extend our understanding beyond alcohol knowledge. Future research is needed to understand if and when adults access information on alcohol. This understanding would form the basis for subsequent research that would then be required to examine people's abilities to evaluate and comprehend the information obtained.

5.3 Implications for public policy

Knowledge of the legal blood alcohol limit was low in Poland in this study and knowledge of standard drinks was low in all three countries. Education is needed to improve awareness in the adult population. Information about standard drinks can be communicated through a variety of means including on beverage packaging, on serving glasses and through driving licence communication channels. Specifically, simple messages can be printed on licence renewal materials to educate adults about standard drinks. People must possess the skills in order to perform necessary behaviours [68] and alcohol knowledge is requisite. For people choosing to drink alcohol they must know both the number of standard drinks contained in the beverages they consume and how many standard drinks they can safely consume.

Regulators need to ensure that adults are sufficiently informed about alcohol. In the absence of being fully informed adults are not able to make the correct decisions about how much alcohol they can consume. At present Australian, Canadian and Polish adults are inadequately informed about the number of standard drinks in wine and to a lesser extent beer. Australian respondents typically underestimate the number of standard drinks contained in glass of wine with an average estimate of 1.2 (standard deviation 0.7) for a glass containing 1.8 standard drinks. Legislated changes requiring wine to be served in standard drink amounts would enhance an adults' ability to accurately 1) judge whether they are able to drive following drinking a glass of wine and 2) to choose to remain within Australian guidelines for low risk drinking. Standard drink information is provided in some jurisdictions and legislation requiring standard drink information along with recommended daily drinking guidelines to be printed on all packaged alcohol products is recommended to ensure that adults are informed about alcohol.

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BENCHMARKING ALCOHOL LITERACY: BADANIA MIĘDZYNARODOWE

Alkohol jest szkodliwą używką wiążącą się z ryzykiem zarówno jednostki, jak i grupy osób. Wiąże się też z dużymi kosztami społecznymi. Poważna debata zajmuje się działaniami marketingowymi w związku z alkoholem, łącznie z podkreślaniem potrzeby większej kontroli ze strony rządu w stosunku do marketingu alkoholu, w celu ograniczenia nadmiernej konsumpcji alkoholu. Istnieje przeciwny pogląd o prawach jednostki do wyboru, gdzie lobbyści odwołują się do specyficznego informowania osób dorosłych. Niniejszy artykuł pokazuje, że ta debata może być przedwczesna, ponieważ osoby dorosłe nie są odpowiednio poinformowane na temat alkoholu. Zostały zebrane dane od ponad 1,500 respondentów z Australii, Kanady i Polski, w celu dostarczenia wstępnego wzorca dla wiedzy o alkoholu. Wyniki tego badania wskazują, że osoby dorosłe nie są wystarczająco poinformowane na temat alkoholu i wpływu spożycia alkoholu na ich zdrowie. Wyniki badania pokazują także, że wiedza dorosłych na temat alkoholu musi po pierwsze być poprawiona, żeby zapewnić wybory, które mogą być dokonywane. W epoce odpowiedzialności społecznej podmioty związane z alkoholem są zobligowane, żeby działać. W wyniki braku w pełni poinformowanych dorosłych, rząd musi działać natychmiast, żeby przeciwdziałać szkodom związanym z alkoholem, krótkookresowo i zapewnić, że dorośli będą zachęceni, na bazie wiedzy własnej o alkoholu, do umiarkowanego spożycia w długim terminie.

Słowa kluczowe: wiedza o alkoholu, marketing społeczny, konsumpcja alkoholu, badania marketingowe.

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