Evidence Brief: Impacts of standard drink labelling

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Background

Alcohol consumption is highly prevalent, daily consumption is increasing, and a sizeable proportion of the population is engaged in harmful alcohol use.[1] According to the 2012 *Canadian Association for Mental Health (CAMH) Monitor eReport*, 17.8% of adults who drink alcohol reported engaging in hazardous or harmful drinking (drinking that could increase physical and mental health problems) and 7.4% of Ontario's adult population reported engaging in weekly binge drinking (consuming five or more drinks on a single occasion weekly).[1]

As part of a national alcohol strategy, Canada's Low-Risk Alcohol Drinking Guidelines (LRADG) were released in November 2011 to help Canadians moderate their alcohol consumption and reduce both short- and long-term alcohol-related harms.[2] The guidelines outline daily and weekly consumption limits and special occasion

limits. Daily and weekly limits include no more than two standard drinks per day and 10 standard drinks a week for women, and no more than three standard drinks per day and 15 standard drinks a week for men.[2] Non-drinking days each week are recommended for both men and women. Special occasion limits recommend that women do not exceed three drinks and that men do not exceed four drinks on any single occasion.[1] However, according to data from the 2009-10 Canadian Community Health Survey (CCHS), on average, approximately 41% of Ontarians 19 years of age and older have consumed alcohol above the gender-specific daily, weekly and special occasion limits outlined in the LRADG.[3] The LRADG also include information on standard drink sizes and highlight that standard drink sizes vary for different types of alcohol. According to the LRADG, one standard drink in Canada is equivalent to 341ml of 5% beer, cider or cooler, 142ml of 12% wine, and 42ml of 40%

distilled alcohol.[2] These standard drinks are equivalent to 13.6 grams of pure ethanol.[4] However, it should be noted that standard drinks vary by country and range from eight grams in the UK to 14 grams in the United States and Portugal.[4]

Drinking guidelines provide limits on the number of standard drinks individuals should be consuming; however many individuals have trouble determining how many standard drinks they are consuming, making it difficult to follow the guidelines. For instance, Kerr et al., (2012) examined consumers' ability to use information about alcohol content on beverages.[5] They found that drinkers have difficulty using percentage alcohol by volume and pour size information in calculating alcohol intake; this may lead to over-pouring or consuming drinks that contain more alcohol than a standard drink.[5] Additionally, Thomas et al., examined drinkers ability to pour a standard drink at a public education fair and found that when not provided with any information regarding standard drink sizes, 75% of drinkers poured more than a standard drink.[6]

Issue and Research Question

Providing standard drink labelling on alcohol containers (i.e., specifying the number of standard drinks per container of alcohol on alcohol containers) may assist drinkers with consuming alcohol within the specified drink limits of the LRADG. However, before implementing such labelling on Canadian alcohol products it is important to understand the impacts this may have among individuals who choose to consume alcohol. This report asks *"What is the evidence regarding the impacts of standard drink labelling?"*.

Methods

A literature search was conducted on August 19, 2014 by a Research Librarian for articles published from its earliest records to present. The search involved five databases including

Ovid MEDLINE, Embase, PsycINFO, CINAHL, and SocINDEX. The full search strategy can be obtained from Public Health Ontario (PHO). All articles retrieved by this search were assessed for eligibility by one reviewer with a 20% sample screened by a secondary reviewer. Where discrepancies between reviewers took place, the full text was reviewed. Articles were eligible for inclusion if they were a primary study that examined the impact of standard drink labelling and included outcome data. Articles that did not provide outcome data, were not a peer-reviewed primary study, and were not related to standard drink labelling were excluded. Because few relevant peer-reviewed articles were identified, primary studies presented in the form of a research poster were included. Full text articles and/or research posters were retrieved, reviewed and relevant information was extracted from each article by one reviewer. To supplement the literature search, references of included studies were hand-searched for additional relevant primary studies, and suggested studies from an author of an included study, and an alcohol policy consultant were also reviewed.

Main Findings

The literature search identified 158 articles, of which 22 primary studies were selected for full-text review and three unique primary studies met the inclusion criteria (one of which was an academic research poster). Six additional studies were identified through hand-searching the references of included studies, one of which met inclusion criteria. Three studies were suggested by the author of an included study, of which, one academic research poster met inclusion criteria. Lastly, one article was suggested by an alcohol policy consultant, and met inclusion criteria. In total, six primary studies (including two research posters) were included in this review.

Three of the primary studies compared the effectiveness of standard drink labelling with percentage alcohol by volume labelling on

participants' ability to accurately estimate and pour standard drinks;[7-9] two studies examined the impact of standard drink labelling on drinkers alcohol consumption when combined with additional labelling information (i.e., drinking guidelines, persuasive messages for moderate drinking and nutrition information),[10,11] and the remaining study used a qualitative analysis to examine how youth use standard drink label information.[12]

Standard drink labelling (SDL) versus percentage alcohol labelling (PAL)

Standard drink labelling (SDL) involves labelling an alcoholic drink container with the number of standard drinks it contains (i.e., a bottle of beer may contain 1.3 standard drinks), while percentage alcohol labelling (PAL) involves presenting the percentage of alcohol content by volume (i.e., a bottle of wine may contain 12% alcohol).[7]

Three primary studies compared the effectiveness of SDL with PAL on a number of outcomes including drinkers' ability to pour a standard drink,[7] estimate the number of standard drinks present in alcohol containers,[8,9] and their preference for label type.[8] All three studies demonstrated an advantage of SDL over PAL for all outcomes measured.[7-9]

The first study by Stockwell et al., (1991) consisted of three small experiments testing participants' ability to accurately pour a standard drink of beer or wine with varied glass sizes and strengths of alcohol.[7] Participants included 72 Australian adult drinkers (24 per experiment), who had drank beer or wine in the previous week, and were 18 years of age or older.

In the first experiment, participants (n = 24) were required to pour a standard drink from a bottle of beer into a glass on six occasions.[7] On the first three occasions one type of alcohol label was used (i.e., SDL or PAL) and in the subsequent three occasions the other label type

was used. One of two brands of alcohol was used for this experiment, both containing 5% alcohol. For each of the three occasions with each type of label, one of three types of glasses was used in balanced order: 1) pony (140 ml), 2) middy (285 ml), and 3) schooner (425ml). The amount of beer poured by participants was measured and the difference between amount poured and correct amount of a standard drink was calculated.

They found a significant advantage of SDL over PAL in participants' ability to accurately pour a standard drink of beer ($p<0.025$).[7] For instance, 48% of participants who were provided with standard drink labels poured a standard drink accurately (within 10% of correct amount) compared with 37% of participants who were provided with percentage alcohol labels.[7] Participants were most accurate for both label types when middy glasses were used, but there was a significant advantage for SDL over PAL when unusual glass sizes were used (i.e., ponies or schooners) ($p<0.05$).[7]

For the second experiment participants (n = 24) were required to pour a standard drink from a 750ml bottle of wine into wine glasses of various sizes (i.e., small (140ml), medium (200ml) and large (240ml)) on six occasions.[7] Two brands of wine were used (both containing 12% alcohol) and were labelled with either percentage alcohol or the number of standard drinks. The glass size, label type (SDL or PAL) and brand were balanced across participants. The amount of wine poured by participants was measured and the difference between amount poured and correct amount of a standard drink was calculated.

The results suggested that there was no significant advantage of SDL over PAL.[7] Participants had equal difficult correctly pouring a standard drink into varied wine glasses regardless of the type of alcohol labelling used.

The third experiment required participants (n = 24) to pour a standard drink from bottles of

beer labelled with either percentage alcohol content or standard drinks on six occasions.[7] For each pouring occasion the same glass (i.e., schooner) was used. However, the brand and strength of the beer varied across participants (i.e., Emu (2.2%), Swan Premium (5%), and Guinness (7.9%)). The order of the label and brand varied systematically among the 24 participants and the difference between amount poured and correct amount of a standard drink was calculated.

Similar to the findings from the first experiment, participants were significantly ($p<0.01$) better at pouring different brands of beer when labelled with standard drinks rather than percentage alcohol by volume.[7] Interestingly, the lowest strength beer (2.2% alcohol) was poured significantly more accurately ($p<0.01$) when standard drink labels were provided compared with percentage alcohol labels, while there was no difference between the two types of labelling for the higher strength drinks (5% and 7.9% alcohol).

Overall, the authors concluded an advantage of SDL over PAL in enabling drinkers to accurately pour a standard drink.[7] While there were no significant differences in mean pouring across all three experiments, the ranges of the mean values were narrower for SDL than PAL.

This advantage was particularly evident for drinkers' ability to pour beer.[7] Beer drinkers had greater accuracy in pouring standard drinks when the bottles had standard drink labels, even when glass size and strength varied. Wine drinkers had equal difficulty with the pouring task whether standard drink or percentage alcohol labels were used.[7]

Stockwell et al., (1991) conducted an additional two-experiment study assessing participants' ability to estimate the number of standard drinks within an alcohol container, as well as their preference for different types of alcohol labelling.[8]

For the first experiment, participants (n= 104) were presented with either 1) three 375ml cans of beer of varying alcohol strengths (2%, 5%, or 7.9%) or 2) half of a 750ml bottle of wine (14% alcohol) and were asked to estimate the number of standard drinks provided on two occasions.[8] They were first asked to estimate the number of standard drinks provided having been presented with a percentage alcohol label; participants were subsequently shown standard drink labels for the containers provided and were asked to make a second estimate.

In the second experiment participants (n= 257) were asked about their knowledge and use of SDL as well as their preference for label type (i.e., SDL versus PAL). Participants for both experiments included Australian adults (18 years of age or older) who drank beer or wine in the previous week.

Results from the first experiment suggest an advantage of standard drink labels over percentage alcohol labels in enabling participants to accurately estimate the number of standard drinks provided.[8] The difference in estimates between the two drink labels (SDL versus PAL) was significant for both beer and wine estimates (p-values <0.0001). Participants consistently underestimated the number of standard drinks with the percent alcohol labels and made significantly fewer errors with the standard drink labels. For instance, those who were provided with beer underestimated the number of standard drinks by 26% when provided with percent alcohol labels and by 4% with standard drink labels. For wine, participants underestimated the number of standard drinks by 25% with percent alcohol labels and by 6% with standard drink labels.[8]

Results from the second experiment suggested that 67.3% of participants had heard of the standard drink system, 17.9% were able to give a correct definition of a standard drink and 11.7% claimed to use standard drinks to monitor their drinking.[8] When asked about their preference for standard drink labels compared

with percentage alcohol labels, 63% preferred standard drink labels, 23% preferred percentage alcohol labels and 13% were undecided.[8]

Lastly, in a recent Canadian study, Osiowy et al., (2014) examined whether standard drink labels would improve participants' accuracy when estimating personal alcohol consumption.[9] Using a 2x3x3 experimental design, participants (n=301, 19 years of age or older who had consumed at least one drink of alcohol in the past 30 days) were presented with six containers of their preferred alcoholic beverage (i.e., beer, wine or spirits). The containers presented differed in alcoholic strength (low, regular, and high) and label type (SDL versus PAL) and participants were asked to estimate the number of standard drinks in either: 1) three cans of beer, 2) half a bottle of wine, or) a quarter bottle of spirits depending on the drink provided.[9] Accuracy was measured using relative and absolute percent errors of estimations in comparison with correct answers.

They found that across all beverage types, (with the exception of regular strength beer), participants were significantly more accurate at estimating the number of standard drinks when provided with SDL compared with PAL ($p<0.001$ in each case).[9] The lack of difference between label types for regular strength beer was likely due to ease of calculation for PAL as one container of regular strength beer was equivalent to one standard drink.

Those participants in the wine and spirit conditions were significantly less accurate at estimating alcohol content than those in the beer condition (p-values<0.01) and participants were significantly less accurate when estimating the number of standard drinks in low strength beverages compared with regular-strength beverages ($p<0.001$).[9] However, there was no significant difference in accuracy between high-strength and regular-strength beverages. Additionally, they found that independent of

label or beverage type, younger participants and those with higher education levels made smaller errors then older participants (>60 years of age) and those with only high-school education respectively.[9]

As a second phase of their study, they also asked participants if they would support the introduction of SDL on alcohol containers in Canada. The majority of participants (82.7%) indicated support for this initiative.[9]

Overall, the results from the above three studies suggest an advantage of SDL over PAL.[7-9] Standard drink labelling results in more accurate pouring (particularly for beer),[7] and estimation of standard drinks consumed.[8,9] It was also the preferred method of drink labelling compared with PAL.[8] The introduction of standard drink labelling was also highly supported among Canadian drinkers.[9]

Combining standard drink labelling with addition labelling information

Two studies by Devos-Comby et al. (2011, 2012) examined the impact of standard drink size information (SDSI) when combined with additional health communications (i.e., drinking guidelines, persuasive messages for moderate drinking and nutrition information) on American college students' alcohol consumption (as measured by number of drinks ordered, blood alcohol concentrations (BAC), and drinking intentions).[10,11]

The first study by Devos-Comby et al. (2012), examined the impact of SDSI posted on bar menus on US college students' drink orders, BAC and intentions to drink.[11] They recruited participants from a college bar and measured their BAC upon entering and exiting using breath samples. Intentions to drink (i.e., how much and what type of alcohol) and number of drinks ordered were also measured.

Participants were asked to order drink and food items from a bar menu that included: 1) SDSI

only, 2) SDSI and drinking guidelines, 3) SDSI, guidelines and an argument for moderate drinking, 4) SDSI, guidelines, argument for moderate drinking as well as recommendations tailored to participants' gender & drinking style. There were also two control groups where no SDSI, guidelines, arguments or recommendations were provided; participants in one control group were asked about their intentions to drink while those in the other control group were not.[11] Participants' BACs, drink orders and intentions to drink (where it was measured), were compared across conditions.

They found that presenting the drinking guidelines along with the SDSI significantly reduced participants' intentions to drink compared to presenting SDSI alone ($p<.01$).[11] However, the combination of SDSI, guidelines and a persuasive argument had a harmful effect on alcohol consumption where participants' exit BACs were higher in this condition compared to those in the no-intention control group, but only marginally so compared to those in the intention-control group.[11] There were also greater increases in BACs in the condition with SDSI, guidelines and an argument for moderate drinking compared to all the other conditions (p-values ranging from .001 to .061).[11]

The results suggest that providing guidelines along with SDSI may help to reduce drinking intentions among college student drinkers, but providing additional information such as arguments for moderate drinking may have a negative effect and increase alcohol consumption.

In a similar study, Devos-Comby et al., (2011) presented US college student drinkers (n= 426, 21 years of age or older) with mock menus from a bar opening soon and asked students to indicate what food and drinks they would likely order if they were to attend the bar for approximately four hours.[10] The menus presented varied in the presence or absence of four health communications: 1) SDSI, 2)

nutrition facts, 3) guidelines for moderate drinking, and 4) positively framed motivational argument for moderate drinking. The number of drinks students indicated they would order were recorded and converted into standard drinks and estimated blood alcohol concentrations (BAC).[10]

The experimental variables had weak effects on the amount of alcohol ordered, and BACs.[10] However, there was a significant interaction between SDSI and nutrition facts information for men (p=0.05). Men indicated that they would order fewer drinks when provided with SDSI combined with nutrition facts information, compared with SDSI alone.[10] No other significant interactions between health communications were found.

Overall, the results from Devos-Comby's two studies suggest that presenting SDSI in conjunction with other health communications such drinking guidelines and nutrition information may help college students to moderate their drinking.[10,11] However, SDSI and guidelines for moderate drinking with the addition of persuasive arguments for moderate drinking may actually increase alcohol consumption.

Uses of standard drink labelling information

Jones et al., (2009) examined the way in which standard drink labels are used among youth.[12] They conducted six, one-hour focus groups (six to 10 participants per group) among 44 Australian college students (18 to 22 years of age) to examine whether youth use standard drink labels in a way that increases or decreases alcohol-related harms.[12] Focus group conversations were directed by a discussion guideline and involved questions about participants' knowledge about standard drinks, situations in which they may have paid particular attention to standard drink labels, and whether standard drink labels influence *what* or *how much* alcohol they consume.

Responses were recorded, transcribed and analyzed for recurring themes between groups.

Overall, they found that participants: 1) had a reasonable understanding of a standard drink, 2) were aware of SDL on alcohol containers (legally required in Australia at the time of study), and 3) use SDL information when purchasing alcohol.[12] However, participants indicated that their use of SDL when purchasing alcohol was predominantly to help them choose stronger drinks to: 1) reduce the amount of liquid consumed, 2) reduce the amount of time taken to get drunk (particularly among males) and to 3) choose the most 'cost-effective' way to get drunk (i.e., to choose the strongest drink for the lowest cost).[12] Participants also indicated some situations in which they would use SDL to make safer drinking choices, but only when they were prompted to do so.[12]

Similarly, in a Canadian study of adult drinkers (19 years of age and older), Osiowy et al., (2014) asked participants how they would use standard drink labelling information if it were provided on Canadian alcohol containers.[9] Similar to the youth responses as seen by Jones et al., (2009), 46.4% of participants indicated that they would use SDL to buy the least expensive alcohol (i.e., the greatest number of standard drinks for the least amount of money).[9] However, a greater percentage of participants indicated that they would use the information for more responsible uses such as to help them or someone else stay below the 0.05 blood alcohol content limit before driving (74%) or to stay within Canada's LRADG (68.3%).[9]

The results suggest that although SDL is intended to help drinkers make more informed alcohol choices and to support moderate drinking, youth may be abusing this information to help them engage in harmful drinking behaviours [12] Adults, on the other hand, may be using this information as intended.[9]

Discussion and Conclusions

Overall, the results from this evidence brief suggest an advantage of SDL over PAL in allowing drinkers to more accurately pour standard drinks,[7] and estimate the number of drinks consumed.[8,9] It was also the preferred labelling method among drinkers,[8] and the introduction of SDL was supported among Canadian adults.[9]

Providing standard drink size information in conjunction with additional health communications such as drinking guidelines and nutrition information may help college students to moderate their drinking;[10,11] however, persuasive messages about moderate drinking may have a negative effect on students' drinking behaviour and may actually increase alcohol consumption.[11]

Lastly, although SDL is intended to help drinkers monitor and moderate their alcohol consumption, youth may be using this information to help them engage in harmful drinking behaviours,[12] while adults may be more likely to use this information for more responsible uses such as to moderate their drinking.[9]

Limitations

It is important to note a few limitations of the included studies. First, because Australia is one of the few jurisdictions in the world (other than New Zealand and the UK) to have mandated SDL,[4] much of the literature (three of the six included studies) are from Australia.[7,8,12] Additionally, none on the included studies examined populations representative of the jurisdiction they were examining. For instance, of the three Australian studies, none of them recruited participants based on a representative sample of the Australian population.[7,8,12] Lastly, half of studies (three of the six included studies) used college students as participants,[10-12] so it is unclear whether these results may be generalizable to other adult populations.

Future research is needed to test the impact and use of SDL among more diverse populations and from jurisdictions other than Australia who already have mandated SDL.

Implications for Practice

The findings from these studies may assist policy makers in decisions regarding the implementation of standard drink labelling. The findings suggest an advantage of SDL over PAL in helping drinkers to more accurately pour standard drinks[7] and to estimate the amount of alcohol consumed,[8,9] which may help drinkers to moderate their alcohol consumption (and potentially stay within Canada's LRADG). These findings provide some support for the implementation of standard drink labelling on all alcohol containers.

The findings may also help health promoters target harmful drinking behaviour among youth. For instance, Jones et al., (2009) found that youth use standard drink labelling to assist them in engaging in harmful drinking behaviours.[12] This is one area health promoters may wish to address in their interventions for the youth population.

Additionally, Devos-Comby et al. (2012), found that combining standard drink size information, drinking guidelines and a persuasive argument for moderate drinking had a harmful effect on youth alcohol consumption,[11] suggesting that health promoters should be cautious in the use of persuasive health messaging targeting the youth population and should pilot test all alcohol-related health messages before using them in their health communication interventions.

Specifications and Limitations of Evidence Brief

This Evidence Brief presents key findings from the scientific literature. Its purpose is to investigate a research question in a timely manner in order to help inform decision making. This report is not a comprehensive review of the literature, but rather a rapid assessment of the best available research evidence. There may be relevant pieces of evidence that are not included and these may alter the conclusions drawn from the document.

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