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Authors

Bright, Stephen J
Fink, Arlene
Beck, John C
et al.

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Research

Development of an Australian version of the Alcohol-Related Problems Survey: A comprehensive computerised screening tool for older adults

Stephen J Bright

Peninsula Health, Frankston, Victoria; and Curtin University, Perth, Western Australia, Australia

Arlene Fink

University of California, Los Angeles; and Langley Research Institute, Pacific Palisades, California, USA

John C Beck

University of California, Los Angeles; and Langley Research Institute, Pacific Palisades, California, USA

Jim Gabriel

B-tree Computing Services, Fontana, California, USA

Dhiren Singh

Peninsula Health, Frankston; and Monash University, Melbourne, Victoria, Australia

Aim: *The Alcohol-Related Problems Survey (ARPS) reliably classifies drinking as non-hazardous, hazardous or harmful using scoring algorithms that consider quantity and frequency of alcohol use alone and in combination with health conditions, medication-use and functional status. Because it has been developed using a 14-g US standard drink, it is not valid in Australia where a standard drink contains 10 g of ethanol.*

Method: *We recalibrated the ARPS scoring algorithms for a 10-g Australian standard drink and updated the list of medications. The Australian ARPS (A-ARPS) was then administered to 50 non-treatment-seeking participants in waves of five.*

Results: *The A-ARPS recalibrated scoring algorithms reliably classified all 50 individuals. Sixty-six per cent were classified as hazardous or harmful drinkers. Many were taking medications that interact with alcohol or had medical conditions that can be exacerbated by alcohol consumption.*

Conclusion: *The A-ARPS is available for use in Australia. Its utilisation could reduce the incidence of alcohol-related harms.*

Key words: *adverse drug event, aged, alcohol-related disorder, prevention and control, screening.*

Correspondence to: Mr Stephen Bright, Peninsula Health. Email: sbright@phcn.vic.gov.au

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Introduction

Older adults living in the community are more likely to drink on a daily basis than any other age group [1], and many are at-risk of experiencing alcohol-related complications [2–4]. The threshold for developing alcohol-related problems for many older adults is less than for younger adults due to changes in physiology (e.g. decreased muscle mass and altered metabolism) [5], increased use of medications [6–8], reduced functional status [9] and medical comorbidities that are more difficult to treat or exacerbated by alcohol [10–12]. The alcohol-related harms that can result from such alcohol consumption have significant economic, health and social costs. Even if the drinking rate were to remain unchanged, these costs are likely to increase given that the population is ageing at an exponential rate [13].

Despite the potential for increasing alcohol-related problems in older people, many older adults are not adequately screened by their general practitioner or other health-care providers [14]. Most screening tools have been designed for younger adults and are not good at identifying older adults engaging in hazardous alcohol use. For example, the Alcohol Use Disorders Identification Test (AUDIT), developed by the World Health Organization [15] as the gold standard screen for hazardous and harmful alcohol use, has been found in a systematic review of the literature to consistently have low sensitivity among older adult populations [16]. This low sensitivity probably relates to the AUDIT not taking into account medications, medical history or functional status – all salient factors in moderating and mediating alcohol-related harm among older adults.

While the two versions of the Michigan Alcoholism Screening Test – Geriatric Form are designed for older adults, they only identify individuals experiencing harmful alcohol use or alcohol dependence, and do not identify individuals who are at-risk of experiencing alcohol-related harm [17]. Yet, at-risk drinkers constitute the largest portion of older drinkers [1] and are the most amenable to treatment in general practice or primary care. Indeed, approximately one-third of alcohol use disorders among older adults do not develop until later in life [18]. If these individuals can be identified as being at-risk of developing an alcohol-related problem, then early intervention that has been found to reduce their risk of experiencing alcohol-related harm can be provided [19].

Developed specifically for older adults using the RAND/UCLA expert panel method [20], the Alcohol-Related Problems Survey (ARPS) is a 10-minute paper-and-pencil and

Figure 1: Sample table for persons reporting to be taking one of the following at least once a week: (a) Sedatives or sleeping medications, (b) anti-psychotics, (c) narcotic medications, (d) nitrates, (e) warfarin, (f) anti-convulsants, (g) anti-depressants or (h) non-prescription antihistamines.

Frequency of drinking	Number of drinks					
	<1	1	2	3	4	5+
Less than or equal to one time per month						
Two to four times per month						
Two to three times per week						
Four or more times per week						
Daily						

Key: Non-hazardous Hazardous Harmful

online screening and education tool that reliably identifies hazardous and harmful patterns of alcohol use [21–24]. The ARPS uses scoring algorithms that take into account quantity and frequency of alcohol consumption alone and in combination with the patient's medical history, current medication use, symptomology, gender and functional status. It also considers binge drinking and drink-driving. The ARPS has been shown to have superior sensitivity to the AUDIT among older adults [21–24]. For example, the AUDIT has been found to have sensitivities ranging between 28 and 66.7% among older adults [16], whereas the ARPS has been found to have a sensitivity of 93% [23].

Like many other tools that assess for alcohol-related problems, the ARPS uses the notion of a 'standard drink' to measure alcohol consumption. Because the amount of ethanol that constitutes a 'standard drink' varies internationally, the psychometric properties of tools that measure 'standard drinks' will vary according to the country where it is being used [25]. The ARPS was developed using a US 14-g standard drink and thus may not be valid to be used in Australia where a standard drink contains 10 g of ethanol. The ARPS may be overly sensitive with limited specificity if used in Australia. For example, a person reporting that he/she drinks 30 g of ethanol (i.e., three Australian standard drinks) would be considered by the ARPS to be drinking 42 g of ethanol, thus overestimating his/her risk of experiencing harm.

This research aimed to examine the feasibility of recalibrating an alcohol screening tool that uses a 'standard drink'. Through modifying the ARPS scoring algorithms so they applied to a 10-g Australian 'standard drink', we aimed to develop an Australian version of the ARPS that would reliably identify hazardous and harmful alcohol consumption among older Australians.

Method

Recalibration process

The ARPS scoring algorithms classify an individual's drinking as either non-hazardous (no known risks), hazardous (at-risk for problems) or harmful (problems are likely). The system first determines each person's risks based on reported quantity and frequency of consumption. It then considers this pattern of consumption in the context of reported medical problems, medication use, symptomology, binge-drinking behaviour, gender and functional status. Thirty-nine tables define the criteria for non-hazardous, hazardous and harmful use for each of these factors (see, e.g. Figure 1). The system then uses algorithms to classify the person's drinking based on the number and types of risk and provides personalised reports that contain educational material to patients and brief reports to healthcare providers.

Each of the 39 tables was altered to reflect the difference between an Australian standard drink and a US standard drink. Specifically, where the US table indicated that one standard drink was hazardous, the table remained unchanged since one US standard drink is the equivalent of 1.4 Australian standard drinks. This rounding down maintained a conservative estimate regarding the potential of an individual's drinking to cause harm. Two US drinks also remained unchanged since an incidental consequence of performing a transposition was that at times it forced one US standard drink to be modified to two Australian standard drinks. Three US standard drinks were converted to four Australian standard drinks (three US standard drinks is the equivalent of 4.2 Australian standard drinks). Four standard drinks were converted to five or more Australian standard drinks (4 US standard drinks is the equivalent of 5.6 Australian standard drinks).

The face validity of the revised tables was then established by having clinicians (DS and JCB) and researchers (AF and SB) examine them. The consensus was that the content of the tables was valid. Following this process, the revised tables were inserted into the pre-existing ARPS computer program by a software engineer (JG). Few logical changes to the software were required to insert the tables since the survey instrument did not change. This design worked well since the report logic had been vetted in the US and so the recalibration focused on the scoring translations.

The wording of the two items pertaining to binge drinking were also altered to reflect the difference between an Australian standard drink and a US standard drink. Specifically, the item assessing binge drinking among women, which asks how often an individual consumes three standard drinks, was modified to four standard drinks, while the item assessing for binge drinking among men, which asks how often and individual consumes four standard drinks, was modified to five standard drinks.

Finally, the ARPS medication items were updated to reflect differences in the brand names of medications in Australia. Those medications unavailable in Australia, such as flurazepam and hydrocodone, were removed. Sometimes similar medications were available in Australia that had similar interactions to those included in the US version of the ARPS. In such cases, these medications were added to the Australian version of the ARPS. For example, benazepril and lisinopril are angiotensin-converting enzyme (ACE) inhibitors that were included on the US version of the ARPS, although they are unavailable in Australia. However, indapamide, which was not included in the US version of the ARPS, is available in Australia and was included in the Australian version of the ARPS. This process was performed by a pharmacist (RP).

Participants

Participants were recruited through community education activities conducted by the researchers. In addition, flyers advertising the research were placed in health-care settings. Information provided in flyers and through community education activities regarding the benefits of participating in the research was limited to the eventual availability of a screening tool for the older adult population and the potential to learn more about the complex relationship between alcohol and health/medications.

To be eligible, people had to be 55 years of age and older and have consumed one or more drinks containing alcohol in the last three months. People who demonstrated cognitive impairment, as assessed by a Mental State Examination [26] at intake, were excluded from the study.

A total of 23 men and 27 women aged between 55 and 89 years ($M = 69.82$ years, $SD = 7.52$) were recruited from the Frankston/Mornington Peninsula area. We tested the Aus-

tralian ARPS (A-ARPS) on waves of five participants. Two physicians (DS and JCB) reviewed the reports to check the fidelity of the output with algorithm logic and resolved any discrepancies through negotiation. Recruitment ceased once three consecutive waves of participants completed the A-ARPS without any errors being identified in the software, scoring system or reports.

Procedure

This research was approved by Peninsula Health's Human Research Ethics Committee. Individuals who expressed an interest in participating in the research were provided with an information letter, which the potential participant read. The information letter outlined that participation in the research required the participant to disclose information about their health and drinking patterns, that this information remained confidential, that they were free to withdraw from the study at any point in time, and that this would not jeopardise any future care. If the individual understood the information provided and agreed to participate, then he or she was required to provide written consent.

Participants were required to complete the A-ARPS on a laptop computer. Once the participant's results had been fully analysed by DS and JCB, the participant was requested to attend a feedback session.

Results

After 50 concurrent reviews of the A-ARPS patient reports, no significant errors were noted in the results from the final three waves of participants, suggesting that the A-ARPS is ready for use with older Australians. Eighty-two per cent of male participants were classified by the A-ARPS to be drinking alcohol at hazardous or harmful levels, while 52% of female participants were assessed to be drinking at hazardous or harmful levels. Age did not appear to be associated with drinking classification with 60% of both the 35 younger-old participants (aged between 55 and 74 years) and the 15 older-old participants (aged older than 74 years) classified as hazardous or harmful drinkers.

Ninety-two per cent of participants reported taking at least one medication that can be affected by alcohol daily or almost daily. Eighty-two per cent reported having at least one medical condition that is affected by alcohol. The most common condition was hypertension, which 60% of participants reported having, followed by osteoporosis (24%), diabetes (16%), in addition to cancer, gout, gastritis and liver dysfunction, each of which were reported by 8% of participants. Fourteen per cent reported that they had been diagnosed with depression, anxiety, a memory disorder or other mental health problem. Of these individuals, 86% reported having at least one comorbid medical condition that can be affected by alcohol.

Discussion

The amount of ethanol that constitutes a 'standard drink' varies internationally. This research has provided a

framework for adapting screening tools that use the 'standard drink' as a measure of alcohol consumption for international use. It has resulted in the availability of an Australian version of the ARPS (to freely access the A-ARPS, please e-mail afink@mednet.ucla.edu). This is significant since there is no similar equivalent to the A-ARPS in Australia.

The availability of the A-ARPS has the potential to improve screening of older adults in Australia. Lack of adequate screening is particularly concerning in older adults because 33% of older adults with alcohol use disorders do not develop these problems until later in life [18]. If these individuals can be identified as being 'at-risk' of developing an alcohol-related problem, then early intervention can be provided. Participation in early interventions can reduce an older adult's risk of experiencing alcohol-related harm [19]. In turn, this has the potential to improve the health and well-being of older adults and also reduce health-care costs.

One reason that older adults have not been adequately screened is that there has been an absence of an appropriate tool. Indeed, older adults are a distinct population and the issues for older adults who drink are unique and often complex. The A-ARPS considers these factors to determine an individual's risk of experiencing alcohol-related harm. Indeed, measures of consumption alone are not effective at estimating hazardous alcohol consumption among older adults. For example, the Australian National Drug Strategy Household Survey [2] reports that in 2010, up to 27.9% of older Australian's engaged in hazardous or harmful alcohol consumption based on self-reported consumption levels. Wilkinson has proposed that this is a significant underestimate since it does not consider the impact of medications and health conditions [3]. Indeed, much higher than expected rates of hazardous and harmful alcohol consumption have been observed in the present sample.

Another reason older adults have not been adequately screened is reluctance by health-care workers. Many physicians and health-care workers simply do not have sufficient office time to accomplish all the recommended preventive activities. The A-ARPS is a time-efficient tool since it is a self-report measure that generates a report that can be considered an intervention in-and-of-itself. Other physicians and health-care workers might feel that they are intruding on the patient's privacy, or simply find it difficult to conceive that an older adult could be drinking excessively. Health-care workers who are exposed to the A-ARPS will incidentally increase their knowledge of the issues that are unique to older adults who drink and also their confidence in raising this issue. Furthermore, the A-ARPS provides a relatively benign mechanism for initiating a discussion about alcohol through first asking about the patient's health and medications. Based on the patients' responses, the resulting information can be used for patient education. For example, within the early intervention being delivered by our service, participants are provided with information about how their specific medication or health condition is affected by alcohol.

It may be important to note that the recalibration process we have described did not provide a perfect transposition due to the rounding that was necessary to circumvent the use of fractions. As such, it is reasonable to assume that the psychometric properties of the A-ARPS will be slightly different from the original US ARPS. Ideally, further research should be conducted to establish the sensitivity and specificity of the A-ARPS. However, the psychometric properties of the ARPS have been well established [22,23], and it is unlikely that the performance of the A-ARPS would be significantly worse.

In conclusion, this research has provided an example of how screening tools can be recalibrated so that they can be utilised internationally. It has led to the availability of the A-ARPS. The A-ARPS is unique in that it considers alcohol consumption within the context of age-specific factors that increase the risk of an older adult experiencing alcohol-related harm. The A-ARPS can be used in other countries that have a standard drink that contains 10 g of ethanol (e.g. New Zealand). It is currently being successfully used within Australia's first older adult-specific alcohol and other drug service at Peninsula Health using tablets placed in clinics and hospital wards.

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Key Points

- Older adults are at increased risk of experiencing alcohol-related harms due to changes in physiology, increased medication use, medical comorbidities and reduced functional status.
- Existing screens are inadequate at identifying at-risk older adults as they do not consider these age-specific factors.
- We have developed an Australian version of the Alcohol-Related Problems Survey (A-ARPS), a comprehensive computerised screening and educational tool that reliably identifies older adults whose drinking places them at-risk of experiencing alcohol-related harm.

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