



A mixed-methods evaluation of an intervention for enhancing alcohol screening in adults aged 50+ attending primary health care

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Handling Editor:

Tim Stokes

Received: 15 July 2024

Accepted: 6 December 2024

Published: 2 January 2025

Cite this: Towers A *et al.* (2025) A mixed-methods evaluation of an intervention for enhancing alcohol screening in adults aged 50+ attending primary health care. *Journal of Primary Health Care* 17(2): 167–175. doi:10.1071/HC24061

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ABSTRACT

Introduction. Adults aged 50 years and over are drinking more than ever but primary health care (PHC) professionals find it challenging to screen them for alcohol-related harm, despite being at greater risk for harm than younger drinkers. **Aim.** This intervention aimed to enhance alcohol screening for this cohort by (a) introducing an algorithm in the patient management system to automate detection of alcohol risk in patients and (b) providing training to support health professionals' practice of, knowledge about, and comfort with alcohol screening in this cohort. **Methods.** Eleven PHC practices in Aotearoa New Zealand took part in this intervention, including 41 PHC health professionals. Development and integration of the automated alcohol screening process within PHC patient management systems was undertaken in parallel with health professional training approaches. **Results.** Screening rates increased substantially at intervention initiation but fell immediately with the onset of the New Zealand COVID-19 national lockdown. Two-thirds of health professionals identified the system screening prompts, over 40% felt this changed their screening practice, and 33% increased their awareness of – and felt more comfortable screening for – alcohol-related risk in those aged 50+. **Discussion.** We illustrated an initial increase in alcohol screening rates in those aged 50+ as a result of this intervention, but this increase could not be sustained in part due to COVID-19 disruption. However, health professionals indicated that this intervention helped many change their practice and enhanced their awareness of such risk and comfort in screening for alcohol-related risk in those aged 50+.

Keywords: Ageing, Alcohol, General practitioners, Primary health care, Professional education, Screening.

Introduction

Aotearoa New Zealand has an ageing population, with more than one-quarter of the population projected to be aged 65 years and over by 2050.¹ Population ageing will impact healthcare systems significantly, particularly as it increases the need for community-based primary health care (PHC) services (eg general practitioners).² Alcohol use is a key contributor to the global burden of disease and injury,³ and use in mid-life is also associated with increased risk of physical and cognitive morbidity^{4,5} and mortality⁶ in ageing populations. Thus, establishing effective screening processes in PHC settings to identify adults aged 50 years and over (henceforth 50+) whose drinking could be hazardous to their health is therefore an important goal that may benefit the entire health sector.

Multiple age-related changes increase the risk of harm from alcohol consumption. First, as we age we experience increased central nervous system sensitivity to alcohol and a decrease in body water and metabolic activity which both increase blood-alcohol concentration for a given dose of alcohol.⁷ Second, we are increasingly more likely to develop health conditions either related to, or exacerbated by, alcohol use as we age.⁸

WHAT GAP THIS FILLS

What is already known: Hazardous alcohol use is increasing substantially in older adults, yet they are less likely than younger adults to be screened for alcohol use and related harms in primary health care.

What this study adds: This research demonstrates the acceptability and value in an approach to identifying alcohol-related harm in those aged 50+ that combines the knowledge of primary health care professionals about alcohol-related harm in this cohort and the use of existing electronic health records to automate detection of risk factors.

Third, drinkers developing health conditions are likely to be medicated for such conditions, thus heightening the potential for mild to severe alcohol-medication interaction, especially as metabolism and excretion of such medications slows with age.⁹ Fourth, alcohol may directly counteract the therapeutic intent of several medications or have compounded adverse effects (eg gastrointestinal (GI) toxicity with non-steroidal anti-inflammatory medications).⁹ Unfortunately, we cannot even rely on the previously assumed cardio-protective health benefits of ‘moderate’ drinking as we age. Much of the evidence underpinning this assumption has now been discounted¹⁰ and subsequent research – including in New Zealand – identifies that alcohol confers no health benefits for adults aged 50+.¹¹

Alcohol consumption in adults aged 50+ is now rising despite the potential risk of harm from even low levels of alcohol use. Research shows that adults aged 50+ are drinking significantly more than previous cohorts of similarly aged adults,^{12,13} that one-in-five could be classified as ‘hazardous’ drinkers (ie drinking at a level that increases harmful outcomes for themselves or others),¹⁴ and that alcohol-related hospital admissions increase steadily with age and such admissions have been increasing annually.¹⁵ Many adults aged 50+ in New Zealand now drink more than their international counterparts,¹⁶ approximately 40% could be classified as ‘hazardous’ drinkers,¹⁷ many have been ‘hazardous’ drinkers since early adulthood,¹⁸ and approximately 12% could be classified as binge drinkers (ie consuming six-or-more drinks in a single session).¹⁹ However, despite the danger that alcohol use poses to older adults,²⁰ this issue is often ignored by health professionals.²¹ Feedback from primary health²² and social care professionals²³ highlights the barriers they perceive to initiating alcohol-related discussions with older adults, including time-constraints in scheduled appointments for other health conditions, the sensitivity of alcohol use as a topic for older adults, their own understanding of the risks for older drinkers, and a feeling alcohol was simply outside their professional remit to discuss. It is not surprising then to find that adults aged 75 years and above have

approximately half the odds of engaging in a discussion with their GP about alcohol compared to someone aged 60–64 years.²⁴

Health professionals in community-based PHC settings in New Zealand are ideally situated to screen for alcohol use.²⁵ However, they face many challenges in doing so, including insufficient consultation time, and lack of confidence in discussing a potentially stigmatising personal behaviour.²⁶ Feedback from general practitioners is that approaches to overcome such barriers and enhance screening in PHC settings would include the automation of alcohol screening utilising existing medical records in the Patient Management System (PMS),²⁶ the use of training on the issue, and a local health professional (ie a recognised ‘clinical champion’) to lead such a project.²⁵ Building on these recommendations, the aim of this study was to enhance alcohol screening rates in PHC practices by (a) integrating an evidence-based alcohol screening computer algorithm – henceforth ‘the algorithm’ – within the PMS used by PHC practices in order to automate detection of alcohol risk in patients aged 50+ and (b) providing training and education to support health professionals practice of, knowledge about, and comfort with screening adults aged 50+ for alcohol use.

Methods

Study design

This was a mixed-method, longitudinal, multi-site study detailing the process of planning, implementing, and evaluating a PHC-based practice intervention, a method useful for targeting a ‘real world’ issue with existing health service delivery.²⁷ This project was funded by the Te Whatu Ora Health New Zealand and a published report for this organisation provides significantly greater detail of our study design, intervention development, data collection, and analysis (see Newcombe *et al.*²⁸). In brief, our cross-disciplinary research team was drawn from experts in local PHC practice and alcohol screening (JM; who was also our ‘clinical champion’), screening and assessment of older adult alcohol use issues (AM), pharmacology (JS), case study methodology (GW), and alcohol and drug epidemiology (AT, DN, JR). We collectively designed and implemented this intervention across 11 PHC practices (ie general practice organisations) in the Whanganui region of New Zealand, an area with significant comorbidities²⁹ and alcohol consumption³⁰ relevant to the current intervention. Furthermore, we engaged in significant consultation with Māori health leaders and iwi (community groups) to discuss and understand appropriate approaches for the design of this intervention, how our team should engage with and acknowledge Māori, as well as identifying appropriate training approaches for health professionals that build on and facilitate such approaches.

Ethics approval for undertaking this project was obtained from the New Zealand Health and Disability Ethics Committee (HDEC) reference 19/STH/65/AM04. This project included three components: (1) algorithm development and integration, (2) supporting discussions about alcohol with patients, and (3) outcome evaluation.

Algorithm development and integration

The algorithm was based on the Comorbid Alcohol Risk Evaluation Tool (CARET), an expert-derived, evidence-based screening tool for identifying alcohol-related risk in adults aged 50+ presenting to PHC settings.^{31,32} The CARET integrates standard alcohol use questions (ie drinking frequency, quantity, and binge episodes) with questions determining the presence of alcohol-harm risk factors for aging adults, namely chronic health conditions (eg high blood pressure, depression), health problems (eg heartburn, falls), and alcohol-interactive medications (eg pain killers, sedatives). We have previously shown moderate agreement between the CARET and Alcohol Use Disorders Identification Test for Consumption (AUDIT-C) in the classification of hazardous drinking in older adults.³³ Algorithm development required multiple steps, outlined in brief here. First, this project reflected an intervention within ‘real world’ PHC practices utilising tools and data available to these health professionals. Of the alcohol-harm risk factors listed in the CARET, our team determined that only chronic health conditions and prescribed medications would be accurately recorded in the PMS, as the remaining factors (eg heartburn, falls) were neither routinely screened for nor recorded and would not, therefore, be evidenced within the PMS. Second, we undertook a rapid and targeted literature review to confirm that the key health conditions and medications contra-indicated for alcohol use in the CARET still reflected current medical evidence. An overview of this rapid review is available from the authors on request. Third, we confirmed that the key medications identified in the CARET were assessed to fall within four broad medication groups identified in the PMS used across the 11 PHC practices (ie musculoskeletal, cardiovascular, analgesia, and central nervous system). Fourth, led by our clinical champion (JM) and the CARET author (AM), and abiding by the *precautionary principle*,³⁴ the medication groups and health conditions were individually assessed by the team to determine the nominal threshold of alcohol use frequency and typical quantity at or beyond which consumption might interact/exacerbate and be hazardous to health (see Table 1).

Where alcohol use is already recorded in the PMS, the algorithm would classify the patient as being in the ‘hazardous’ drinking range if drinking thresholds for any of the medication or comorbid health problems were met or exceeded (see Fig. 1). This would appear as a prompt (red flag) on the PMS, alerting the PHC professional to rescreen

Table 1. CARET-based algorithm risk thresholds for alcohol consumption level specific to distinct health condition, health problem, and medication group.

Conditions	Minimum alcohol consumption pattern to indicate hazardous alcohol use	
	Standard drinks per occasion ^A	Days drinking per week
High blood pressure	3	4+
	4	2+ month
	5+	Any
Gout	2	4+
	3	2+
	4+	Any
Diabetes and on insulin (Therapeutic Group Endocrine and Metabolic Disorders/insulin preparations)	3	4+
	4	2+ month
	5+	Any
Any mental health diagnosis	2	4+
	3	2+
	4+	Any
Active/chronic hepatitis or cirrhosis/liver condition	Any	Any
Hereditary and degenerative problems of the CNS	2+	2+
	Any	4+
Problems		
Problems sleeping	2+	4+
Memory problems	2+	2+
	Any	4+
Falling/accidents	2+	2+
	Any	4+
Medications		
Musculoskeletal (all except rubefacients)	2	4+
	3	4+
	4+	Any
Cardiovascular	2	4+
	3	4+
	4+	Any
Analgesia	2	4+
	3	4+
	4+	Any
Central nervous system	2	4+
	3	4+
	4+	Any

^AA standard drink contains 10 g of ethanol. The presence of any instance of binge drinking (defined as single-occasion consumption of six or more for men and five or more for women) indicated immediate risk for all conditions, problems, and medication groups.

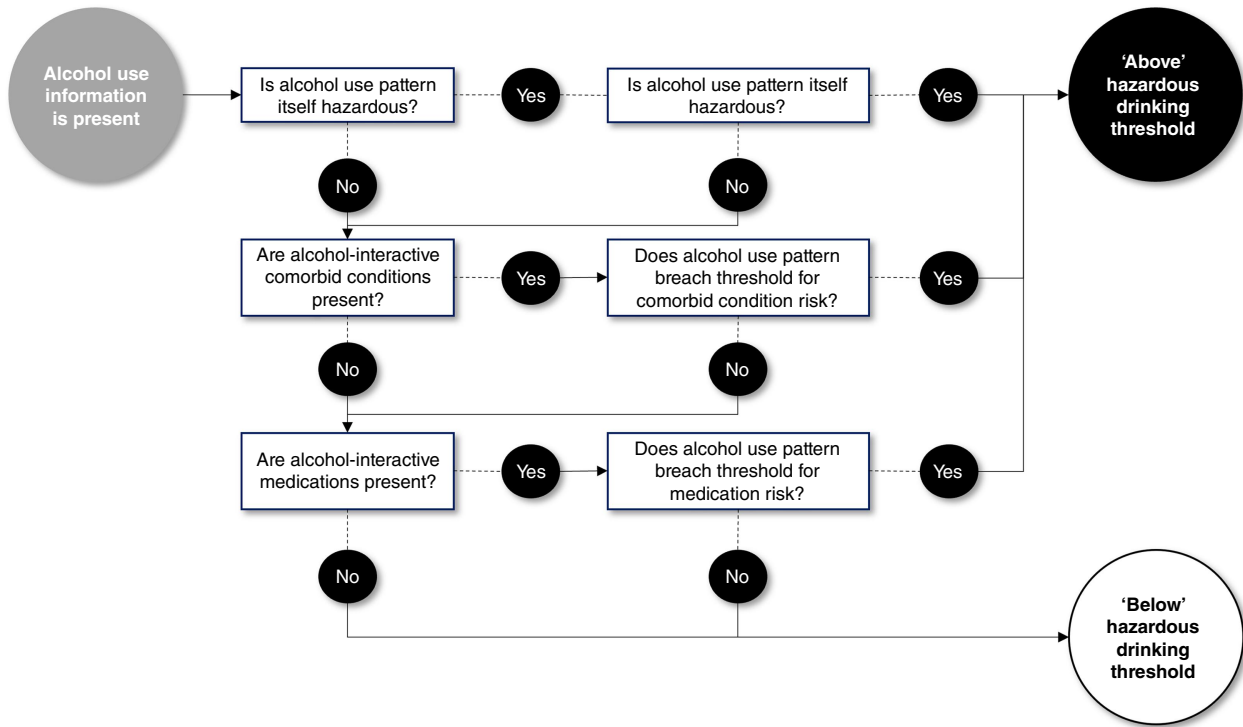


Fig. 1. Identifying potential hazardous drinking for older adults when alcohol use data are present.

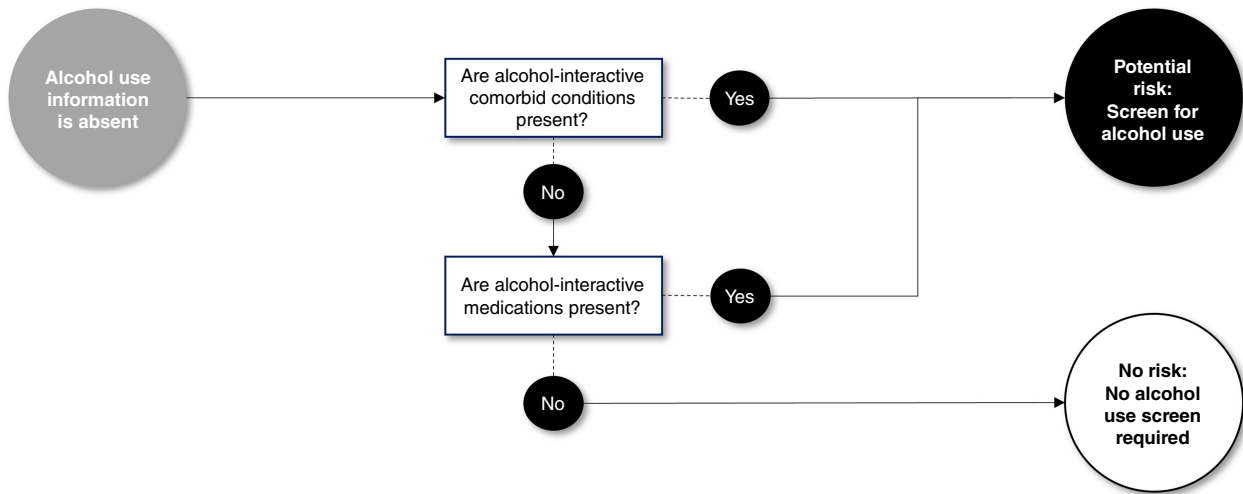


Fig. 2. Identifying potential alcohol risk for older adults with no alcohol use data.

the patient for current alcohol use to confirm that the patient was still at risk. Where alcohol use was not recorded in the PMS, the algorithm would identify that the patient had chronic conditions and/or alcohol-interactive medications likely to increase the risk of alcohol use and prompt the health professional to screen the patient using an indicator on the PMS (see Fig. 2). The clinical champion worked with the PMS software engineer to embed this algorithm into the PMS. Mock cases differing in alcohol use patterns, levels of

comorbid issues, and medication use were created by the team and entered into the PMS to test both the screening process, the set thresholds distinguishing ‘hazardous’ drinking from non-hazardous drinking, and the appearance of appropriate prompts. The embedded algorithm was then pilot tested by the clinical champion with health professionals at one PHC practice to assess health professional use and understanding of the process *in situ*. The algorithm (incorporating the CARET) went live simultaneously across all PHC practices.

Supporting discussions about alcohol with patients

In parallel to algorithm integration and intervention roll-out, the team supported health professionals' confidence in discussing alcohol with patients by providing training on multiple areas related to screening and engagement. First, through face-to-face and ongoing online workshops with the clinical champion, health professionals were all provided training on the algorithm-supported screening process, what prompts to expect in the PMS, and how to manage them. Second, a broad set of training opportunities were designed for health professionals that supported engagement practices in communicating with patients about alcohol use, and the management of identified alcohol use concerns. This training was designed to provide continuing medical education (CME) credits (for general practitioners) and continuing professional development (CPD) credits (for other PHC professionals) and was supported via existing CME and CPD knowledge networks. Understanding the time and resource limitations facing health professionals, these training opportunities included e-learning components, such as an online short-course offered through the University of Auckland Goodfellow Unit, as well as webinars and podcasts about clinical management of alcohol use issues in PHC settings. The training also included face-to-face options, such as training workshops on Māori approaches to motivational interviewing including techniques such as open-ended questions, affirmations, reflections and summaries (OARS³⁵), evening educational seminars on the current evidence concerning alcohol use trends and risk for adults aged 50+, and clinical peer review of cases at the Royal New Zealand College of General Practitioners (RNZCGP) Whanganui sub-faculty. All training opportunities were optional for health professionals to attend (ie there was no compulsion).

Outcome evaluation

Three methods were used to evaluate the outcomes of this project. First, the primary intent of this project was to enhance the overall rate of alcohol screening undertaken in patients aged 50+ attending any of the 11 PHC practices. Our team assessed this change using quantitative analysis of the extant screening indicator variables in the PMS used by these PHC practices. Working with the PMS software engineer and data management officers from the Whanganui District Health Board, we developed a dataset of collective monthly screening rates across the 11 PHC practices for all patients aged 50+ ($n = 24,411$). We then compared collective monthly screening rates post-intervention (February 2020–November 2020) against a baseline rate reflecting the average monthly screening rate in a 3-month pre-intervention period (November 2019–January 2020). The use of PMS data reflects the intent of this project to be a pragmatic intervention in a 'real world' PHC setting which,

if successful, could be replicated in other areas of the country with no requirement for additional and potentially burdensome data collection methods.

The second evaluation was a quantitative online survey exploring the level of health professional engagement with the training provided, awareness of change with the alcohol screening process, and perceived changes in their alcohol screening practice. Invitations for participation, including the online Qualtrics survey link, were sent to the 41 health professionals working across the 11 government-funded, community-based PHC practices included in this project, and 21 completed this survey (14 general practitioners, three practice nurses, two nurse practitioners, and two other health professionals).

The third evaluation method was semi-structured interviews of seven health professionals (five general practitioners, and two nurses) who completed the online survey and had indicated on that survey that they consented to be interviewed. These were undertaken face-to-face, via telephone or video call (depending on participant preference) by a qualitative interview specialist (GW) who was independent of the algorithm development and health professional training components of this intervention. Interviewees were asked about the utility of the intervention to support screening, discussions about alcohol with patients, attendance and utility of the training opportunities, and barriers experienced throughout this intervention. Interview responses were recorded, transcribed, and analysed using thematic analysis to identify key themes.³⁶

Results

Screening rates

The number of alcohol-related screens increased at the time of initial training, indicating an immediate impact of the intervention over baseline. However, these screening numbers decreased immediately with the onset of the first national COVID-19 lockdown (April–May 2020) and effectively reverted to baseline in the months following lockdown (see Fig. 3). The reduction in screening rates associated with the national lockdown reflected direct advice given to all PHC providers indicating that the principle focus of their work during the national lockdown was on the management of chronic and/or acute illnesses, with normal screening processes significantly reduced in priority.

Health professional engagement and practice change

Approximately 50% ($n = 21$) of the 41 health professionals included in this intervention completed an online evaluation survey. Table 2 provides an overview of this data, including

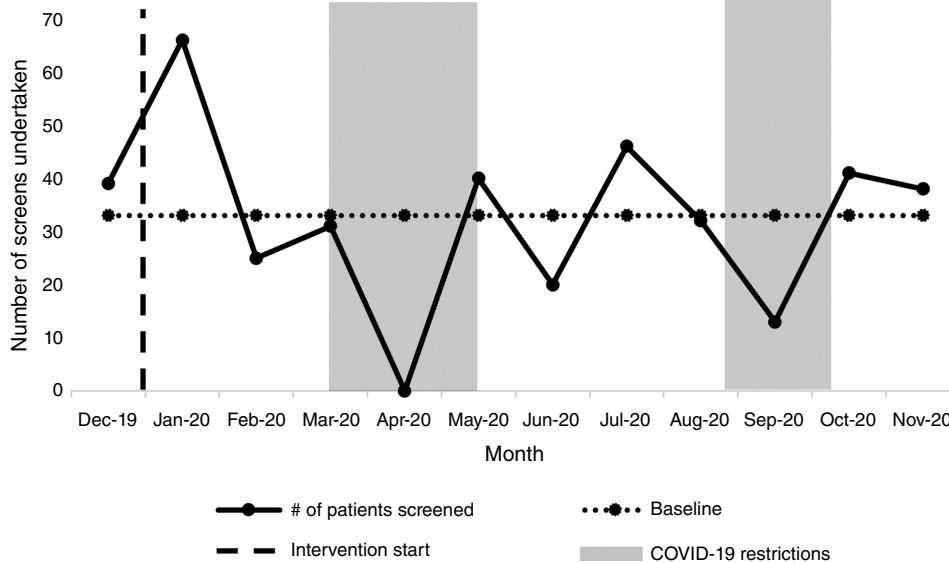


Fig. 3. Number of patients screened each month (December 2019 to November 2020) compared to the number of patients screened at baseline (ie November 2019). Note: periods of COVID-19 restrictions are indicated by shaded bars.

their engagement with training and perceived effect training and intervention had on their practice. Only half of the respondents were able to engage with the training in this intervention, and this engagement favoured the face-to-face information and evidence workshop rather than skills training (eg the motivational interviewing workshop) or online CME-related e-learning opportunities. However, almost two-thirds of respondents were aware of the intervention and the ‘red flags’ indicating hazardous drinking in the PMS, and 43% felt this helped change their screening practice. Over 40% indicated that this process changed their alcohol screening practice. One-third of the respondents felt the training raised their awareness of the increased risk of alcohol for adults aged 50+ and that they were more comfortable in screening them for alcohol use, but only 14% indicated that training had improved confidence in discussing alcohol use with adults aged 50+.

Health professional feedback on screening intervention utility

The first theme from the interviews was that all interviewees felt the PMS prompts (ie red flags) were useful in identifying patient alcohol risk, facilitating discussions about alcohol use, and legitimising such discussions for both parties. Example comments to this effect were:

I pay attention when I see the red comes up ... I am more likely to discuss the effect of alcohol on their general conditions. (Participant 2)

It’s made it much easier to bring it up with people because you can say “Hey it’s flashing up red ... um ... can I quickly ask you about alcohol?”. (Participant 3)

I might say “the computer is recommending this based on expert advice”. (Participant 7)

A further theme was that the PMS prompts helped remind interviewees to consider patient alcohol use within the wider context of morbidity and medication use, for example:

It made me more aware of the potential, yep, the interaction with the alcohol. (Participant 6)

Concerning training, a key theme from interviewees was that the training they had engaged with was useful for their practice, particularly the face-to-face skills training that enabled interactive feedback with others, for example:

We did some role plays and so on which gave people the opportunity to try out their skills and get some feedback on their communication. (Participant 3)

Peer meetings also have been great for discussion. (Participant 4)

However, a common theme for most interviewees was the existence of barriers to engagement with training opportunities, largely concerning their busy work roles, which may explain why 48% of survey respondents had failed to engage with any of the available training:

It’s just in times when I can’t drive down. (Participant 1)

There is a continual struggle with work life balance. (Participant 2)

I should say that I consider myself one of the burnt-out doctors. (Participant 4)

Table 2. Health profession feedback on engagement with training and changes to the alcohol screening process on the Patient Management System (PMS).

	N	%
Total number of respondents	21	100
Total number of respondents engaging with training opportunities		
Face-to-face workshops on evidence for enhanced alcohol screening	6	29
Face-to-face motivational interviewing training sessions	3	14
Face-to-face clinical peer review meetings	4	19
Online training e-learning available on the Goodfellow Unit website	2	10
None of the above	10	48
Total number of respondents that in their practice:		
Were aware of the new alcohol screening protocol	13	62
Noticed the 'red flag' prompts indicating hazardous drinking	13	62
Felt the intervention changed their alcohol screening practice	9	43
Total number of respondents that felt the training helped improved their:		
Awareness of the increased risk of alcohol use for adults aged 50+	7	33
Knowledge of the increased risk of alcohol use for adults aged 50+	1	>1
Understanding of the need to screen adults aged 50+ for alcohol use	5	24
Confidence in discussion alcohol use with adults aged 50+	3	14
Total number of respondents confirming they are more comfortable with:		
Screening adults aged 50+ for alcohol use	7	33.3
Managing adults aged 50+ with alcohol use issues	3	14.3
Following up adults aged 50+ regarding alcohol use and potential issues	3	14.3

Discussion

This was a mixed-method, longitudinal, multi-site, socio-technical collective case study of an intervention intended to enhance alcohol screening rates in PHC practices by (a) integrating an evidence-based alcohol screening algorithm within the PMS used by PHC practices in order to automate detection of alcohol risk in patients aged 50+, and (b) providing training and education to support health professionals practice of, knowledge about, and comfort with screening adults aged 50+ for alcohol use. The results of this intervention were mixed. We were able to automate alcohol screening and provide training to support health professionals' alcohol screening practice, but while alcohol screening rates initially rose, we were unable to sustain either growth or even sustained screening rates above

baseline across the intervention. While COVID-19 interruptions may have played a significant role in our intervention results, our findings unfortunately reflect ongoing results from larger international studies, with intensive interventions proving difficult to undertake in PHC settings and largely unsuccessful in raising screening rates.³⁷ Johnson and colleagues³⁸ identify the multiple challenges in changing the alcohol screening behaviour of health professionals in PHC settings, and these likely played a role with our intervention. Specifically, while our intervention targeted two known challenges – health professional training and time-burden of screening – there were others that we could not overcome including the time constraints, competing priorities, and patient needs that health professionals must address.

Despite a lack of main effect, we do not believe this undermines the potential value of our intervention. We successfully developed and integrated a best-practice alcohol risk algorithm within the PMS of PHC practices to automate the detection of hazardous alcohol use in adults aged 50+. Utilising thresholds tailored to individual patient risk based on their health condition and medication use profiles, health professionals found this automated screening process useful in highlighting potential risk, facilitating discussions with patients, and legitimising the need for such discussions. Feedback from health professionals provides mixed support for the effectiveness of this intervention in supporting or enhancing screening practice. While two-thirds of respondents were aware of the intervention and recognised the PMS prompts, only one-third indicated that this intervention had made them more aware of the risks of alcohol for those aged 50+ and more comfortable in screening this cohort for such risk. Feedback on health professional engagement with training opportunities also illustrates that such training was well received by those who could attend, but that almost half of the health professionals across the 11 PHC practices were unable to attend or access any of the face-to-face or online training opportunities, principally due to a lack of time. Furthermore, of those attending training, the preference was for face-to-face workshops rather than online education. Despite these issues our results appear interestingly similar to those of Brennan and colleagues³⁹ who provided alcohol screening and brief intervention training for rural Australian general practitioners. They found only 50% of their sample were able to attend training, but that those attending reported that it increased their knowledge and confidence to undertake alcohol screening.

Strengths and weaknesses

This intervention had both strengths and weaknesses. The first strength was the partnership with a local 'clinical champion'. They were able to lead the design and development of this intervention on behalf of the local PHC health professionals and could emphasise for them the clinical importance and patient benefits of the work being undertaken in a manner that facilitated their engagement.

A second strength of this intervention was the focus on a low-burden approach to enhancing alcohol screening. By utilising extant patient medical records, we were able to demonstrate how normally time-burdensome screening processes could not only be automated but done so in a manner providing risk-thresholds specific to the health profile of the patient themselves. However, a key weakness of this current intervention was the inability to counter the lack of time available for health professionals to engage with training opportunities. While a range of face-to-face and online training opportunities were provided in anticipation of such issues, the reality was that almost half were unable to attend any such training. It is possible that a more efficient approach that may have supported health professionals' attendance would have been to provide fewer training options but more repetition of these offerings.

Implications for health policy, practice, and future research

A PMS-based alcohol screening algorithm was delivered across PHC practice for the purposes of this project, but it remains live even now at project conclusion. To this extent, despite mixed findings, this algorithm will still support alcohol screening by prompting health professionals in these practices to discuss alcohol use with older clients whose records highlight risk factors for their drinking. This also supports the replication of this algorithm within the PMS of other PHC practices around the country as a simple and pragmatic foundation for supporting alcohol screening enhancement.

Three points relevant to the current intervention now require investigation. First, would it be possible to replicate this pilot in a randomised controlled trial approach within which we could assess 'dose' of the intervention across time and compare to a control set of PHC practices? Feedback suggested that this intervention supported knowledge and practice enhancement for some health professionals, but the limitations of this pilot design (eg use of time-limited baseline rather than PHC practice control sites) may have provided more evidence of utility. Second, while automated screening processes may enhance the detection of alcohol-related risk in those aged 50+, does this translate into improved management of these patients? It is unclear from our data the degree to which such detection was associated with adequate or enhanced management of alcohol-related issues. Third, do we have the appropriate resources and health system pathways required for the management of adults aged 50+ who are now identified as hazardous drinkers? International evidence highlights the need for the management of such drinkers but that current avenues for support are not designed for this cohort.⁴⁰ The answers to these questions have direct implications for the sustainability of alcohol screening and management practice for older adults. Our project provides an algorithm to support alcohol screening enhancement in PHC practices but

highlights that the algorithm alone is insufficient to overcome barriers in alcohol screening and management. These barriers likely relate to the sustainability of and support for health professional training, and the need for a system of options appropriate for the management of older drinkers.

Conclusion

We illustrated an initial increase in alcohol screening rates in people aged 50 years resulting from this intervention, but multiple factors (including the COVID-19 disruption) make it unclear whether such enhanced alcohol screening rates could have been maintained throughout the intervention period. Despite failure to maintain enhanced screening rates, almost half of the health professionals responding to our survey indicated that this intervention helped change their practice, and one-third felt it enhanced their awareness of – and comfort in screening for – alcohol-related risk in those aged 50+.

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Data availability. The quantitative data used in this manuscript reflects an audit of existing data in the Patient Management System (PMS). It was anonymised for the purpose of this research and is not publicly available for further analysis. The anonymised qualitative data generated in interviews with health professionals is available on contact with the authorship team.

Conflicts of interest. The authors declare no conflicts of interest.

Declaration of funding. This project was funded by the New Zealand Health Promotion Agency and undertaken between 2019 and 2021.

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