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Clinician assessment, advice and referral for multiple health risk behaviours: prevalence and predictors of delivery by primary health care nurses and allied health professionals

Kathleen M McElwaine, BPsyc(Hons I), ^{a,b,c,*} Megan Freund, PhD, ^{a,b,c} Elizabeth M Campbell, PhD, ^{a,b,c} Carolyn Slattery, BSocSc, ^a Paula M Wye, PhD, ^{a,b,d} Christophe Lecathelinais, DESS de Mathématiques Appliquées, ^a Kate M Bartlem, BPsyc(Hons I), ^{a,c,d} Karen E Gillham, MSocSc, ^{a,c} John H Wiggers, PhD. ^{a,b,c}

- a. Population Health, Hunter New England Local Health District, Newcastle, Australia
- b. Faculty of Health, The University of Newcastle, Newcastle, Australia.
- c. Hunter Medical Research Institute, Clinical Research Centre, Newcastle, Australia.
- d. Faculty of Science and Information Technology, The University of Newcastle, Newcastle, Australia.

* Corresponding author at: Postal address: Population Health, Hunter New England Local Health District, Locked Bag 10, Wallsend, NSW, Australia, 2287.

Telephone: +61 2 49 246 374; Fax: +61 2 49 246 215; email:

Megan.Freund@hnehealth.nsw.gov.au

Email addresses:

KM: Kathleen.McElwaine@hnehealth.nsw.gov.au

MF: Megan.Freund@hnehealth.nsw.gov.au

EC: Libby.Campbell@hnehealth.nsw.gov.au

CS: Carolyn.Slattery@hnehealth.nsw.gov.au

PW: Paula.Wye@hnehealth.nsw.gov.au

CL: Christophe.Lecathelinais@hnehealth.nsw.gov.au

KB: Kate.Bartlem@hnehealth.nsw.gov.au

KG: Karen.Gillham@hnehealth.nsw.gov.au

JW: John.Wiggers@hnehealth.nsw.gov.au

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Abstract

Objective

Primary care clinicians have considerable potential to provide preventive care. This study describes their preventive care delivery.

Methods

A survey of 384 community health nurses and allied health clinicians from in New South Wales, Australia was undertaken (2010-11) to examine the assessment of client risk, provision of brief advice and referral/follow-up regarding smoking inadequate fruit and vegetable consumption, alcohol misuse, and physical inactivity; the existence of preventive care support strategies; and the association between supports and preventive care provision.

Results

Preventive care to 80% or more clients was least often provided for referral/follow-up (24.7% to 45.6% of clinicians for individual risks, and 24.2% for all risks) and most often for assessment (34.4% to 69.3% of clinicians for individual risks, and 24.4% for all risks). Approximately 75% reported having 9 or fewer of 17 supports. Provision of care was associated with: availability of a paper screening tool; training; GP referral letter; and number of supports.

Conclusion

The delivery of preventive care was limited, and varied according to type of care and risk. Supports were variably associated with elements of preventive care.

Practice Implications

Further research is required to increase routine preventive care delivery and the availability of supports.

Keywords: Community Health Services; Delivery of Health Care; Health Prevention; Health Risk Behaviors; Health Care Providers.

1. Introduction

In developed countries, tobacco smoking, poor nutrition, risky alcohol use and physical inactivity constitute the primary behavioural risks for the most common causes of mortality and morbidity [1-3]. In such countries, the majority of adults have at least one chronic disease risk [4-6], and a substantial proportion have three or more [4, 6, 7]. Routine, opportunistic delivery of preventive care by primary health care service providers to all clients is recommended to reduce this disease burden [8-11] with systematic review evidence supporting the efficacy of such care [12-16]. It has been recommended that such care be provided for multiple risks [8-10], and given the competing priorities and brevity of a clinical consultation, that its essential elements include: risk assessment, brief advice and referral/follow-up [10, 11, 17].

Primary health care clinicians are potentially key providers of preventive care [18-31] as they have a focus on chronic disease prevention [20, 32] and deliver care on multiple occasions to population groups with a high prevalence of behavioural health risks [20, 21, 32, 33]. The multi-disciplinary nature of the primary care workforce in many countries offers further potential for the delivery of preventive care [26, 34-38]. This workforce can include a variety of health care professionals such as nurses, physiotherapists, dietitians, occupational therapists, and other allied health professionals [26, 32, 37-39].

Despite the potential of primary health care services to provide preventive care, studies of the prevalence of its delivery have reported less than optimal levels of delivery for a range of risk factors [40-43]. Similarly, research regarding the prevalence of such care provided by primary care nurses and allied health clinicians

suggests variable and often sub-optimal levels of care delivery [33, 38, 44-61], particularly regarding referral or follow-up [50, 54, 56], with care delivery varying by type of preventive care, health risk behaviour [33, 38, 45-50, 54, 56, 57, 59-62], service type and other service characteristics including location and consultation type [33, 56, 62-64], client's presenting condition [33] and health care provider characteristics such as education level/knowledge, length of employment and age [50, 63]. However, existing studies have focused primarily on the delivery of preventive care for single behavioural risks (predominantly smoking) [44-47, 49, 50, 52-56, 58, 60], and on single elements of preventive care, predominantly risk assessment [33, 46, 47, 49, 50, 54, 56, 58-61] and/or brief advice [38, 44, 46-57, 59-61], with no single study describing the prevalence of each of the recommended multiple elements of preventive care for the four behavioural risks (smoking, poor nutrition, risky alcohol use and physical inactivity) individually or combined. The prevalence of care provision by primary care nurses and other allied health clinicians for each of the recommended elements of preventive care for multiple health risk behaviors is unknown.

Systematic reviews and intervention trial evidence have reported that the availability of practice support strategies (strategies that support best practice care delivery) in the clinical practice setting is important for the uptake of recommended forms of clinical practice by health providers generally [65] and for the provision of preventive care by primary health care providers specifically [35, 46, 49, 60, 66-68]. Strategies suggested by such studies to be effective in facilitating practice change include: printed educational materials, educational meetings, local opinion leaders, audit and feedback, and reminders [65]. Intervention research involving nurses and other allied

health clinicians within the primary care setting also suggests that multi-strategic interventions using combinations of such strategies can improve preventive care [49, 60, 67-69]. However, all studies were related to the provision of preventive care for a single behavioural risk, mostly smoking [46, 49, 67-69].

No studies have reported the prevalence of practice support strategies other than training for nurses and allied health clinicians in the primary healthcare setting [44, 47, 51, 54-56, 64]. These studies suggest the availability of such training is limited (range: 4% to 60%) [44, 47, 51, 54-56, 64]. Furthermore, no studies examined the association between the availability of multiple practice support strategies and the provision of multiple elements of preventive care for all four behavioural risks.

Given the limitations of past research regarding the delivery of preventive care by primary care nurses and other allied health clinicians, a study was undertaken to assess: a) the prevalence of recommended elements of preventive care (assessment, brief advice, and referral/follow-up) provided by primary care nurses and other allied health clinicians to address smoking, inadequate fruit and vegetable consumption, risky alcohol use, physical inactivity, and all four risks combined; b) the prevalence of practice support strategies for the delivery of such care; and c) the association between the availability of practice supports and the delivery of such preventive care.

2. Methods

2.1 Design and setting

A cross sectional survey of primary health care nursing and allied health clinicians across a network of public community health facilities in one health district of New

South Wales (NSW), Australia was undertaken between May 2010 and January 2011. In Australia, public community health services [36], are the second largest provider of health care to the general population after general practitioners [20, 70]. The district includes 56 community health facilities and serves a population of approximately 840,000 people in metropolitan, regional, rural and remote locations. Nurses encompassed registered nurses and other nurses; allied health clinicians encompassed: psychologists/psychiatrists/counselors, social workers, occupational therapists, physiotherapists, dietitians/nutritionists, among others.

Public community health services in NSW have a focus on improving and maintaining health and wellbeing of individuals, families and local communities [20]. All facilities were subject to a district wide policy regarding the delivery of preventive care that required: the routine assessment of all clients regarding their status for four behavioural health risks (smoking, inadequate fruit and vegetable consumption, risky alcohol use, and physical inactivity); and the provision of brief advice and referral/follow up for clients identified as being at risk.

The data were obtained as the baseline survey of an intervention trial [71], and approved by the Hunter New England Area (approval No. 09/06/17/4.03) and the University of Newcastle Human Research Ethics Committees (approval No. H-2010-1116).

2.2 Participants and recruitment

All 56 community health facilities in the district were eligible to participate. The facilities were staffed by nurses and allied health clinicians. Clinicians were employed

at the following services: community nursing, allied health, community child and family health, diabetes services, and aged care services (approximately 1300). Clinicians were eligible if they: had at least 10 appointments with adult clients (≥ 18 years) within the last two months; had been employed for at least three months; and were not contractors. Services ineligible for inclusion were: sexual assault, palliative care, aged care assessment, dementia, genetics, and child protection services. Such services were deemed ineligible based upon the advice from the clinical services.

2.3 Data collection procedures

An email from the District Director of Primary and Community Health was sent to all facility managers asking them to encourage clinician participation in the survey. A sample of approximately 40% of clinicians was randomly selected from an electronic community health staff database. The selected clinicians were posted an information letter, contacted by phone to confirm eligibility, and asked to participate in a computer-assisted telephone interview during work hours. The 20 minute survey was pilot tested with clinicians and conducted by trained interviewers.

Selection of 40% of staff was expected to yield a sample of around 400 clinicians (based on selection of 500 and an 80% participation rate). This sample size would allow an estimate of prevalence of care with a precision of approximately $\pm 2.5\%$ (assuming worst case of 50% prevalence).

2.4 Measures

2.4.1. Clinician descriptors

Data regarding service and clinician characteristics collected via the survey included: clinician age (<40, 40-49, 50-59, 60+); Aboriginal or Torres Strait Islander status (yes, no); current employment status (full time, part time, casual, other); number of years in their discipline (≤ 2 , 3-4, 5-9, 10+), and years working in community health (≤ 2 , 3-4, 5-9, 10+). Clinicians also reported their risk status in the past month for each of four behavioural risks (smoking, inadequate fruit and vegetable consumption, risky alcohol use, and physical inactivity) based on validated or recommended survey items [72-75].

Clinician and service characteristics regarding gender, professional discipline, geographic remoteness (based on service postcode) [76] and service type were obtained from the health service human resources database.

2.4.2. Preventive care delivery

Clinicians were asked to estimate the proportion of new adult clients they had seen in the last two months that they had provided each element of preventive care for each risk (0 to 100%, don't know), unless contraindicated (e.g. moderate alcohol consumption advice for pregnant clients).

Behavioral risk status assessment. Clinicians estimated the proportion of clients that they had asked about their: smoking status; fruit and vegetable intake; alcohol consumption; and current physical activity levels.

Brief advice. Clinicians reported the proportion of clients with each risk behavior to whom they provided advice to: quit smoking, or to use Nicotine Replacement Therapy or other medications to help with quitting; eat more fruit or vegetables; reduce alcohol consumption; and increase physical activity levels. “For example, clinicians were asked “Of your clients who were doing inadequate levels of physical activity, what proportion did you advise to increase their physical activity levels?”.

Referral/follow-up care. Clinicians reported the proportion of clients with each risk behavior to whom they provided the following forms of referral/follow-up:

- Information or advice about free specialist prevention telephone counseling services available (Quitline service for smoking: www.icanquit.com.au/further-resources/quitline; Get Healthy Information and Coaching telephone service for inadequate fruit and vegetable consumption or physical inactivity: www.gethealthynsw.com.au). The telephone services are funded by the NSW state government to provide a free behavior change support service delivered by qualified health coaches on multiple occasions to members of the public. There is no available similar service for alcohol.
- Arranged for the telephone counseling service to call the client.
- Advised to talk to their General Practitioner/Aboriginal Medical Service provider (GP/AMS) about the behavioral health risk.
- Advised to access other specialist services (e.g. a dietician, drug and alcohol counsellor, physiotherapist etc.).
- Forwarded a summary of ‘at risk’ client’s preventive care health risk behaviors to their GP/AMS.

2.4.3. Practice support strategies

Clinicians reported on the availability of 17 possible practice support strategies and resources that could assist the delivery of preventive care (yes, no, don't know). Items were then grouped within the following categories (based on strategy groupings used in Cochrane systematic reviews) [65]: leadership, educational meetings, printed educational materials and supports, audit and feedback, and reminders/prompts (see Table 3).

2.5 Statistical analysis

All statistical analysis was undertaken using SAS (version 9.2). Descriptive statistics were used to describe sample characteristics. Clinician characteristics obtained from the health service human resources staff database were linked to the survey data. Participant and eligible non-participant characteristics were compared using chi-square analyses ($p < .05$).

Descriptive statistics were used to describe: the proportion of clinicians who reported providing risk assessment, brief advice, and referral/follow-up for each risk separately and for all risks combined (derived analytically from the individual risk items) using the following categories: 0%, 1-49%, 50-79%, and 80-100% of clients; and to describe the prevalence of practice support strategies. A 'number of available supports' score was calculated and categorised into three levels (0-4, 5-9, 10-17).

2.5.1 Optimal preventive care

Based on recommendations of clinical guidelines [8-11] for routine clinician delivery of preventive care to all clients regarding multiple risks [8-10], optimal care delivery was defined as preventive care delivery to 80% or more clients for all risks combined. These optimal care delivery variables were created by combining outcome measures for the individual risks: smoking, inadequate fruit and vegetable consumption, alcohol misuse, and physical inactivity.

Assessment. Clinicians assessed 80% or more clients for all four risks.

Brief advice. Clinicians provided 80% or more of ‘at risk’ clients with brief advice for all four risks.

Referral/follow-up. Clinicians provided at least one of the following options to 80% or more ‘at risk’ clients for all risks: spoke about the telephone service; arranged for the telephone service to call the client; advised clients to talk to their GP/AMS; advised other types of support; or forwarded a summary of all the clients risk behaviors to the client’s GP/AMS.

Chi-square analysis was initially used to examine the association between optimal preventive care delivery (for all risks combined) for each of the three preventive care outcomes (assessment, brief advice, referral/follow-up) and the reported availability of practice supports (variables shown in Table 3). Service and clinician characteristics were also tested to identify other potential predictors.

Variables with a p-value of 0.20 or less from the chi-square analyses were then included in separate logistic regression models for each of the three care elements. A backward selection process was adopted for each regression model [77] whereby the variable with the highest *p* value was removed until all predictors in the model had a *p*

value less than .05. Any potential interaction between variables that remained in the final model was also examined to ensure the model was sound and that results for each variable could be interpreted independently from other variables [77].

3. Results

3.1 Sample characteristics

Of 493 randomly selected clinicians, 462 (93.7%) were eligible. Ineligible clinicians were those who saw no new adult clients in the prior 2 months ($n=13$), or had left the service ($n=18$). Of the eligible clinicians 384 completed the survey (83.1%). Thirty clinicians refused, 37 were on leave, and 11 could not be contacted. Participating clinician and service characteristics are provided in Table 1. Compared to participants, eligible non-participants were more likely to be from major cities ($p=0.03$), and more likely to be from community nursing services and less likely to be from allied health services ($p<0.01$). The study sample was representative of the full population of clinicians from within the health district, with the exception of service type ($p<0.01$), whereby child and family health services were underrepresented (10.2% vs 16.7%).

3.2 Prevalence of preventive care delivery

The proportion of clients reported by clinicians to have received preventive care are shown in Table 2. Assessment was delivered to the majority (80% or more) of clients most frequently for smoking (69.3%) and least frequently for inadequate fruit and/or vegetable consumption (34.4%). For brief advice, care delivery to the majority of clients was most frequent for physical inactivity (56.5%) and least for alcohol overconsumption (40.4%). The type of referral/follow-up provided most often to the

majority of clients for smoking and alcohol overconsumption was advice to talk to the GP/AMS (32.6% and 18.8% respectively), and for physical inactivity and inadequate fruit and vegetable consumption, advice to use other types of support (31.0% and 29.4% respectively) (Table 2). For individual risks, a number of clinicians reported providing care to 0% of their clients; ranging from 12.8% to 30.0% for assessment, 23.4% to 54.4% for brief advice, and from 28.9% to 96.1% of clinicians for referral/follow-up.

Regarding the prevalence of optimal care delivery (care to 80% or more clients for all risks combined), 23.4% of clinicians reported providing client assessment, 15.6% reported delivering brief advice, and 24.2% of clinicians reported providing at least one form of referral (Table 2).

3.3 Prevalence of practice support strategies

Commonly reported practice support strategies included the existence of a preventive care policy, the availability of client handouts, and that their manager believed the provision of preventive care was important (68-94%) (Table 3). Clinicians were least likely to report the availability of real time reminders, performance feedback, and a nominated support staff member (16-23%). Approximately three-quarters of clinicians (74.7%) reported at most only 9 of the 17 supports were available.

3.4 Association between the availability of practice supports, service and clinician characteristics and optimal preventive care delivery

3.4.1 Assessment

The presence of a paper screening tool and provision of clinician training were positively associated with the provision of optimal levels of risk assessment for all risks combined. Additionally, clinicians from diabetes services, nursing disciplines, and clinicians whose personal fruit and vegetable consumption and physical activity

levels were not in the risk category were positively associated with the provision of optimal levels of risk assessment for all risks combined (Table 4).

3.4.2. Brief advice

The automated production of a referral letter for the client's GP was positively associated with the provision of optimal levels of brief advice for all risks combined. Additionally, clinicians from diabetes services, those who were male, those who had worked in community health for 10 or more years, and those who were not at risk themselves for inadequate fruit and vegetable consumption, but were at risk for alcohol overconsumption and smoking, were positively associated with the provision of optimal levels of brief advice for all risks combined (Table 4).

3.4.3. Referral

The availability of more than four practice supports was positively associated with optimal referral/follow-up (at least one type of referral to 80% **or more** clients for each risk). Additionally, clinicians from diabetes and aged care service types, and services located in major cities were positively associated with optimal referral/follow-up (Table 4).

No interactions were found between variables that remained in the final regression for each of the three models.

4. Discussion and conclusion

4.1 Conclusions

The study findings suggest community health nursing and allied health clinicians do not provide preventive care in a manner that is consistent with clinical guidelines. The prevalence of each element of preventive care being provided to the majority (80% or more) of clients for individual risks were variable and did not exceed 69%, with optimal preventive care for all risks combined being low. Most preventive care practice support strategies were not available to the majority of clinicians. Although the availability of such support strategies was associated with the provision of preventive care, such an association was not generalised, with single strategies being associated with the provision of single elements of preventive care. Such findings suggest that a need exists for further research to identify strategies for increasing the provision of all recommended elements of preventive care for multiple health risk behaviours.

This study highlights the existence of low levels of optimal preventive care for multiple risk factors for all of the three care elements examined (maximum 24.2%). It highlights the untapped potential among this group of clinicians within primary health care, particularly as individuals frequently present with more than one risk [5, 7], and clinical guidelines recommend preventive care delivery across multiple risks [8-10]. Furthermore, while there is equivocal evidence surrounding the greater efficacy of the simultaneous versus sequential delivery of multiple behavior interventions [78, 79], some evidence suggests multiple-behaviour interventions have a greater impact on public health than single-behaviour interventions [1, 80]. Although it highlights the potential of these professional groups, this study may also bring to the fore the difficulty inherent in the provision of preventive care for multiple risk factors, as

evident from the higher levels of care reported for individual risks compared to all risks combined. Future research should endeavor to make multiple behavior interventions more effective, cost effective and/or less demanding for clients and clinicians [78].

Despite the difficulty in comparing the findings of this study with past research due to methodological differences between studies, the pattern of preventive care delivery is similar to that found previously [33, 38, 44-61, 81]. There were generally higher levels of assessment, moderate levels of brief advice, and lower levels of at least one referral. Although assessment was most frequently provided for smoking, over 30% of clinicians still do not assess the majority of clients. Of the four risks, assessment was lowest for fruit and vegetable consumption, whereby over 65% of clinicians do not assess the majority of clients. This delivery of preventive care is incongruent with the prevalence of such risks among clients, whereby inadequate fruit and vegetable consumption is most prevalent, and smoking least prevalent [82].

The provision of brief advice was generally lower than assessment (with the exception of fruit or vegetable under consumption), and again while most frequently provided for smoking, almost half of clinicians (45%) do not provide brief advice to the majority of at risk clients. However, relative to assessment, there was less variation in the provision of brief advice to the majority of clients across the four risks. While provided least frequently for alcohol overconsumption, the difference compared to smoking brief advice was less than 15%.

Levels of care to the majority of clients regarding the various referral/follow-up outcomes for individual risks were variable and generally lower than assessment and

brief advice, but were similarly most frequently provided for smoking (and while highest for at least one referral/follow-up, this was only provided by under half of clinicians). While there were a range of options utilized across each of the risks, the community telephone services did not appear to be widely used despite their potential as an effective referral source [83-85]. Even more familiar referral points such as the client's GP/AMS were not high. Furthermore, after accounting for clinicians who did not provide other types of support because they provided this support in their role, the rate of referral was still low (see Table 2, footnotes). Potentially referral to sources outside of community health facilities and to telephone services is less familiar to clinicians [38]. Referral may be less readily considered part of their remit compared to assessment and brief advice [38]. The general trend of increased preventive care provision regarding smoking cessation is likely due to the more well-established guidelines [86] and greater client acceptability generally of smoking cessation care provision [82].

The availability of strategies suggested to be effective in facilitating practice change including printed educational materials, educational meetings, local opinion leaders, audit and feedback, and reminders [65], were not widely available to clinicians. Furthermore, despite the existence of a preventive care policy, there was only moderate awareness of it (68.2%). Such findings suggests a broader adoption of support strategies is required to assist with the delivery of all elements of preventive care and that additional investment in modifying the clinical practice environment is required if care delivery is to occur at a level that is to realise the intended benefit of opportunistic delivery of preventive care by health care providers [87].

Although at least one type of support (of 17) was associated with each element of preventive care, no one type of practice change support nor number of supports was positively associated with all elements of preventive care. Such a finding challenges the sufficiency of a one-size-fits-all approach to the type of practice change strategies implemented to support each of the elements of care for all risks. This finding is novel because unlike past studies (which were predominantly conducted in a limited number of facilities) [33, 38, 44, 46, 47, 51, 57, 61], this study examined associations across a large network of services that encompass a wide variety of clinicians and service types. Further, it is the only known study in this setting to examine the association of supports with multiple elements of care for any of the four risks. Furthermore, findings of differential care delivery by service type further challenge a one-size-fits-all approach. Research should investigate if support strategies should be tailored to the care elements required, and change across a network of services and between service types.

With regard to the study limitations, the findings may be an overestimation of care delivery, as the study outcomes were based on clinician self-report, and healthcare professionals have been found to often overestimate their performance by around 20% to 30% [88]. However, such an overestimation would reinforce the low levels of preventive care delivery found by this study. Additionally, the generalizability of the study findings may be limited as the community health services were sampled from one health district of one state of Australia. However, the range of services and clinician types included in the study may make the findings relevant to other researchers and policy makers.

4.2 Conclusions

This study highlights the untapped potential among nursing and allied health **clinicians** in primary care systems in the provision of preventive care [26, 37, 38]. This group of professionals have reach in accessing the Australian population [20, 31, 70] and can provide clients a broad range of referral/follow-up opportunities. The finding that preventive care is delivered differentially based on available supports confirms the need for additional strategies to support all primary care nurses and allied health **clinicians** to adopt an opportunistic primary prevention approach to the provision of preventive care to all clients. Practice change theories [89-92] and evidence from reviews of practice change interventions suggest a multi-strategic approach is most likely to increase clinician provision of preventive care on an opportunistic basis [31, 93-98].

4.3 Practice Implications

Further research and intervention are required to increase the low levels of preventive care delivery and increase the clinician supports available, ensuring a focus across all elements of preventive care, from assessment to referral/follow-up.

"I confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story."

References

References

1. Prochaska JJ, Spring B, Nigg CR. Multiple health behavior change research: an introduction and overview. *Prev Med* 2008;46:181-8.
2. World Health Organisation (WHO). The World Health Report: Reducing risks, promoting healthy lifestyle. Geneva: WHO, 2002
3. Australian Institute of Health and Welfare (AIHW). Australia's Health 2010. Canberra: AIHW, 2010
4. Poortinga W. The prevalence and clustering of four major lifestyle risk factors in an English adult population. *Prev Med* 2007;44:124-8.
5. Australian Institute of Health and Welfare (AIHW), O'Brien K. Living dangerously: Australians with multiple risk factors for cardiovascular disease. Canberra: AIHW, 2009 Bulletin No. 24. AIHW Cat. No. AUS 57.)
6. Fine LJ, Philogene GS, Gramling R, Coups EJ, Sinha S. Prevalence of multiple chronic disease risk factors: 2001 National Health Interview Survey. *Am J Prev Med* 2004;27:18-24.
7. Hausdorf K, Eakin E, Whiteman D, Rogers C, Aitken J, Newman B. Prevalence and correlates of multiple cancer risk behaviors in an Australian population-based survey: results from the Queensland Cancer Risk Study. *Cancer Cause Control* 2008;19:1339-47.

8. The Royal Australian College of General Practitioners. Guidelines for Preventive Activities in General Practice (The Red Book) 7th Edition. Melbourne: The Royal Australian College of General Practitioners, 2009
9. US Department of Health and Human Services. The Guide to Clinical Preventive Services 2009. Rockville, MD: Agency for Healthcare Research and Quality, 2009(Pub. No. 09-IP006.)
10. Glasgow RE, Goldstein MG, Ockene JK, Pronk NP. Translating what we have learned into practice. Principles and hypotheses for interventions addressing multiple behaviors in primary care. Am J Prev Med 2004;27:88-101.
11. Ministry of Health. New Zealand Smoking Cessation Guidelines. Wellington: Ministry of Health, 2007
12. Brunner E, Rees R, Ward K, Burke M, Thorogood M. Dietary advice for reducing cardiovascular risk. Cochrane Database of Systematic Reviews 2007;Issue 4. Art. No.: CD002128. DOI: 10.1002/14651858.CD002128.pub3.
13. Kaner EF, Beyer F, Dickinson HO, Pienaar E, Campbell F, Schlesinger C, Heather N, Saunders J, Burnand B. Effectiveness of brief alcohol interventions in primary care populations. Cochrane Database of Systematic Reviews 2007;Issue 2. Art. No.: CD004148. DOI: 10.1002/14651858.CD004148.pub3.
14. Foster C, Melvyn Hillsdon, Thorogood M. Interventions for improving physical activity. Cochrane Database of Systematic Reviews 2005;Issue 1. Art. No.: CD003180. DOI: 10.1002/14651858.CD003180.pub2.

15. Rice VH, Stead LF. Nursing interventions for smoking cessation. The Cochrane Database of Systematic Reviews 2008;Issue 1. Art. No.: CD001188. DOI: 10.1002/14651858.CD001188.pub3.
16. Rigotti NA, Munafo MR, Stead LF. Interventions for smoking cessation in hospitalised patients. Cochrane Database of Systematic Reviews 2007;Issue 3.Art. No.: CD001837. DOI:10.1002/14651858.CD001837.pub2.
17. Laws RA, Kemp LA, Harris MF, Davies GP, Williams AM, Eames-Brown R. An exploration of how clinician attitudes and beliefs influence the implementation of lifestyle risk factor management in primary healthcare: a grounded theory study. Implement Sci 2009;4:doi:10.1186/1748-5908-4-66.
18. New South Wales (NSW) Department of Health. A new direction for NSW. State Health Plan. Towards 2010. Sydney: NSW Department of Health, 2007
19. Australian Government. A healthier future for all Australians. Final report. Canberra: Australian Government, 2009
20. New South Wales (NSW) Health. Integrated primary and community health policy 2007-2012. North Sydney, NSW, Australia: NSW Health, 2006
21. Eagar K, Owen A, Cranny C, Samsa P, Thompson C. Community Health: The state of play in New South Wales. A report for the NSW Community Health Review. Centre for Health ServiceDevelopment, University of Wollongong, 2008

22. Owen A. Community Health: The evidence base. A report for the NSW Community Health Review. Centre for Health Service Development, University of Wollongong, 2010
23. Laws R, Davies G, Williams A, Eames-Brown R, Amoroso C, Harris M. Community Health Risk Factor Management Research Project. Final Report February 2008. A feasibility study. Sydney: University of NSW, 2008
24. Goldstein MG, Whitlock EP, DePue J. Multiple behavioral risk factor interventions in primary care. Summary of research evidence. Am J Prev Med 2004;27:61-79.
25. Truman BI, Smith-Akin CK, Hinman AR, Gebbie KM, Brownson R, Novick LF, Lawrence RS, Pappaioanou M, Fielding J, Evans CA, Jr., Guerra FA, Vogel-Taylor M, Mahan CS, Fullilove M, Zaza S. Developing the Guide to Community Preventive Services-overview and rationale. The Task Force on Community Preventive Services. Am J Prev Med 2000;18:18-26.
26. Whitlock EP, Orleans CT, Pender N, Allan J. Evaluating primary care behavioral counseling interventions: An evidence-based approach. Am J Prev Med 2002;22:267-84.
27. West R, McNeill A, Raw M. Smoking cessation guidelines for health professionals: an update. Thorax 2000;55:987-99.
28. RACGP. Guidelines for preventative activities in general practice. South Melbourne, Victoria: The Royal Australian College of General Practitioners; 2009.

29. New South Wales (NSW) Department of Health. Guide for the management of nicotine dependant inpatients. Gladesville, NSW: Better Health Centre, 2002
30. U.S.Department of Health and Human Services. The Guide to Clinical Preventive Services 2008: Recommendations of the U.S. Preventive Services Taskforce. Rockville, MD: Agency for Healthcare Research and Quality, 2008AHRQ Pub. No. 08-05122.)
31. Fiore MC, Jaen CR, Baker TB. Treating tobacco use and dependence: 2008 update. Clinical practice guideline. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service, 2008
32. Owen A. Community Health: The evidence base. A report for the NSW Community Health Review. Centre for Health Service Development, University of Wollongong, 2010
33. Laws RA, Jayasinghe UW, Harris MF, Williams AM, Davies GP, Kemp LA. Explaining the variation in the management of lifestyle risk factors in primary health care: A multilevel cross sectional study. BMC Public Health 2009;9:165.
34. Gardiner K, Douglas K, Gear A et al. Primary Health Care Position Statement: A scoping of the evidence. An update for 2009. Canberra: ANU APHCRI, 2009
35. Glasgow NJ, Sibthorpe B, Gear A. Primary Health Care Position Statement: A Scoping of the Evidence. Canberra: ANU APHCRI, 2005

36. Australian National Preventive Health Agency. Evidence for Preventive Health and Health Promotion through Primary Health Care. ANPHA, 2012
37. National Preventative Health Taskforce. Australia: the healthiest country by 2020. A discussion paper. Canberra: 2008
38. Chan B, Laws R, Williams A, Davies G, Fanaian M, Harris M, the CN SNAP Project Team. Is there scope for community health nurses to address lifestyle risk factors? the community nursing SNAP trial. BMC Nursing 2012;11:4.
39. Smith K, Bazini-Barakat N. A Public Health Nursing Practice Model: Melding Public Health Principles with the Nursing Process. Public Health Nurs 2003;20:42-8.
40. Stange KC, Flocke S, Goodwin M, Kelly R, Zyzanski S. Direct observation of rates of preventive service delivery in community family practice. Prev Med 2000;31:167-76.
41. Britt E, Miller G, Charles J et al. General Practice Activity in Australia 2007-2008 . Canberra: AIHW, 2008Cat No, GEP 22.)
42. Fretts RC, Rodman G, Gomez-Carrion Y, Goldberg R, Sachs BP, Myers E, Kessel B. Preventive health services received by minority women aged 45-64 and the goals of healthy people 2000. Womens Health Issues 2000;10:305-11.
43. McAvoy BR, Kaner EF, Lock CA, Heather N, Gilvarry E. Our Healthier Nation: are general practitioners willing and able to deliver? A survey of attitudes to and involvement in health promotion and lifestyle counselling. Br J Gen Pract 1999;49:187-90.

44. Dauenhauer JA, Podgorski CA, Karuza J. Prescribing Exercise for Older Adults: A Needs Assessment Comparing Primary Care Physicians, Nurse Practitioners, and Physician Assistants. *Gerontol Geriatr Educ* 2006;26:81-99.
45. Hung DY, Shelley DR. Multilevel analysis of the chronic care model and 5A services for treating tobacco use in urban primary care clinics. *Health Serv Res* 2009;44:103-27.
46. Borrelli B, Lee C, Novak S. Is provider training effective? Changes in attitudes towards smoking cessation counseling and counseling behaviors of home health care nurses. *Prev Med* 2008;46:358-63.
47. Klink K, Lin S, Elkin Z, Strigenz D, Liu S. Smoking cessation knowledge, attitudes, and practice among community health providers in China. *Fam Med* 2011;43:198-200.
48. Si D, Bailie RS, Dowden M, O'Donoghue L, Connors C, Robinson GW, Cunningham J, Condon JR, Weeramanthri TS. Delivery of preventive health services to Indigenous adults: response to a systems-oriented primary care quality improvement intervention. *Med J Aust* 2007;187:453-7.
49. Bakker MJ, Mullen PD, de Vries H., van Breukelen G. Feasibility of implementation of a Dutch smoking cessation and relapse prevention protocol for pregnant women. *Patient Educ Couns* 2003;49:35-43.
50. Kim JS, Song MS, Oh HE. Predictors of tobacco-control activities of community health practitioners: report from a national survey. *J Korean Acad Nurs* 2004;34:1443-50.

51. Dillman CJ, Shields CA, Fowles JR, Perry A, Murphy RJL, Dunbar P. Including physical activity and exercise in diabetes management: Diabetes educators' perceptions of their own abilities and the abilities of their patients. *Can J Diabetes* 2010;34:218-26.
52. Burman ML, Kivlahan D, Buchbinder M, Broglio K, Zhou XH, Merrill JO, McDonell MB, Fihn SD, Bradley KA. Alcohol-related advice for veterans affairs primary care patients: Who gets it? Who gives it? *J Stud Alcohol* 2004;65:621-30.
53. Hall S, Marteau TM. Practice nurses' self-reported opportunistic smoking cessation advice in three contexts. *Nic Tob Res* 2007;9:941-5.
54. Glover M, Paynter J, Bullen C, Kristensen K. Supporting pregnant women to quit smoking: Postal survey of New Zealand general practitioners and midwives' smoking cessation knowledge and practices. *N Z Med J* 2008;121:53-64.
55. McDermott MS, West R, Brose LS, McEwen A. Self-reported practices, attitudes and levels of training of practitioners in the English NHS Stop Smoking Services. *Addict Behav* 2012;37:498-506.
56. Akpanudo SM, Price JH, Jordan T, Khuder S, Price JA. Clinical psychologists and smoking cessation: treatment practices and perceptions. *J Community Health* 2009;34:461-71.
57. Runciman P, Watson H, McIntosh J, Tolson D. Community nurses' health promotion work with older people. *J Adv Nurs* 2006;55:46-57.

58. Tesoriero JM, Gieryic SM, Carrascal A, Lavigne HE. Smoking among HIV positive New Yorkers: prevalence, frequency, and opportunities for cessation. *AIDS Behav* 2010;14:824-35.
59. Aspy CB, Mold JW, Thompson DM, Blondell RD, Landers PS, Reilly KE, Wright-Eakers L. Integrating Screening and Interventions for Unhealthy Behaviors into Primary Care Practices. *Am J Prev Med* 2008;35 (5 Suppl):S373-S380.
60. Kaner E, Lock C, Heather N, McNamee P, Bond S. Promoting brief alcohol intervention by nurses in primary care: a cluster randomised controlled trial. *Patient Educ Couns* 2003;51:277-84.
61. Bailie RS, Togni SJ, Si D, Robinson G, d'Abbs PH. Preventive medical care in remote Aboriginal communities in the Northern Territory: A follow-up study of the impact of clinical guidelines, computerised recall and reminder systems, and audit and feedback. *BMC Health Serv Res* 2003;3:15.
62. Hopkins SC, Lenz ER, Pontes NM, Lin SX, Munding MO. Context of care or provider training: the impact on preventive screening practices. *Prev Med* 2005;40:718-24.
63. Laws R, Kirby S, Powell-Davies GP, Williams A, Jayasinghe U, Amorosa CL, Harris Mark F. 'Should I and can I?': A mixed methods study of clinician beliefs and attitudes in the management of lifestyle risk factors in primary health care. *BMC Health Serv Res* 2008;8:doi:10.1186/1472-6963-8-44.

64. Douglas F, Torrance N, van TE, Meloni S, Kerr A. Primary care staff's views and experiences related to routinely advising patients about physical activity. A questionnaire survey. *BMC Public Health* 2006;6.
65. Grimshaw JM, Eccles MP, Lavis JN, Hill SJ, Squires JE. Knowledge translation of research findings. *Implement Sci* 2012;7:50. doi:10.1186/1748-5908-7-50.
66. Papadakis S, McDonald P, Mullen KA, Reid R, Skulsky K, Pipe A. Strategies to increase the delivery of smoking cessation treatments in primary care settings: a systematic review and meta-analysis. [Review]. *Prev Med* 2010;51:199-213.
67. Moher M, Yudkin P, Wright L, Turner R, Fuller A, Schofield T, Mant D. Cluster randomised controlled trial to compare three methods of promoting secondary prevention of coronary heart disease in primary care. *Br Med J* 2001;322:1338.
68. Secker-Walker RH, Dana GS, Solomon LJ, Flynn BS, Geller BM. The role of health professionals in a community-based program to help women quit smoking. *Prev Med* 2000;30:126-37.
69. Katz DA, Brown RB, Muehlenbruch DR, Fiore MC, Baker TB, AHRQ Smoking Cessation Guideline Study Group. Implementing guidelines for smoking cessation: comparing the efforts of nurses and medical assistants. *Am J Prev Med* 2004;27:411-6.

70. New South Wales Department of Health. Community Health Risk Factor Management Research Project: Summary of Key Findings. Sydney, Australia: NSW Health, 2008
71. McElwaine KM, Freund M, Campbell EM, Knight J, Slattery C, Doherty EL, McElduff P, Wolfenden L, Bowman J, Wye P, Gillham KE, Wiggers JH. The effectiveness of an intervention in increasing community health clinician provision of preventive care: A study protocol of a non-randomised, multiple-baseline trial. BMC Health Serv Res 2011;11:1-9.
72. Heatherton T, Kozlowski L, Frecker R, Faberstrom K. The Fagerstrom Test for Nicotine Dependence: A revision of the Fagerstrom Tolerance Questionnaire. Br J Addict 1991;86:1119-27.
73. Australian Bureau of Statistics (ABS). National Nutrition Survey selected highlights Australia 1995. Canberra: ABS, 1997
74. Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG. AUDIT. The alcohol use disorders identification test: Guidelines for use in primary care. Geneva: World Health Organisation, 2001
75. Marshall AL, Hunt J, Jenkins D. Knowledge of and preferred sources of assistance for physical activity in a sample of urban Indigenous Australians. Int J Behav Nutr Phys Act 2008;5:doi:10.1186/1479-5868-5-22.
76. Department of Health and Aged Care. Measuring remoteness: Accessibility/Remoteness Index of Australia (ARIA). Canberra: Australian Government, 2001

77. Hosmer D, Lemeshow S. Applied logistic regression. Canada: John Wiley & Sons Inc; 2000.
78. Prochaska JO. Multiple Health Behavior Research represents the future of preventive medicine. [Review] [24 refs]. *Prev Med* 2008;46:281-5.
79. Vandelanotte C, Reeves MM, Brug J, De B, I. A randomized trial of sequential and simultaneous multiple behavior change interventions for physical activity and fat intake. *Prev Med* 2008;46:232-7.
80. Johnson SS, Paiva AL, Cummins CO, Johnson JL, Dymment SJ, Wright JA, Prochaska JO, Prochaska JM, Sherman K. Transtheoretical model-based multiple behavior intervention for weight management: effectiveness on a population basis. *Prev Med* 2008;46:238-46.
81. Ashby S, James C, Plotnikoff R, Collins C, Guest M, Kable A, Snodgrass S. Survey of Australian practitioners' provision of healthy lifestyle advice to clients who are obese. *Nursing & Health Sciences* 2012;14:189-96.
82. McElwaine KM, Freund M, Campbell E, Knight J, Bowman J, Doherty E, Wye P, Wolfenden L, Lecathelinais C, McLauchlin J, Wiggers J. The delivery of preventive care to clients of community health services. *BMC Health Serv Res* 2013;13:doi:10.1186/1472-6963-13-167.
83. Stead LF, Perera R, Lancaster T. Telephone counselling for smoking cessation. *Cochrane Database of Systematic Reviews* 2006;Issue 3. Art. No.: CD002850. DOI: 10.1002/14651858.CD002850.pub2.

84. Eakin EG, Lawler SP, Vandelanotte C, Owen N. Telephone interventions for physical activity and dietary behavior change: a systematic review. *Am J Prev Med* 2007;32:419-34.
85. Pierce JP, Newman VA, Natarajan L, Flatt SW, Al-Delaimy WK, Caan BJ, Emond JA, Faerber S, Gold EB, Hajek RA, Hollenbach K, Jones LA, Karanja N, Kealey S, Madlensky L, Marshall J, Ritenbaugh C, Rock CL, Stefanick ML, Thomson C, Wasserman L, Parker BA. Telephone counseling helps maintain long-term adherence to a high-vegetable dietary pattern. *J Nutr* 2007;137:2291-6.
86. Fiore MC, Bailey W, Cohen S. Smoking cessation: clinical practice guideline no. 18. Rockville, US: Agency for Health Care Policy and Research, US Department of Health and Human Services, 1996
87. Moulding NT, Silagy CA, Weller DP. A framework for effective management of change in clinical practice: dissemination and implementation of clinical practice guidelines. *Qual Health Care* 1999;8:177-83.
88. Adams AS, Soumerai SB, Lomas J, Ross-Degnan D. Evidence of self-report bias in assessing adherence to guidelines. *Int J Qual Health Care* 1999;11:187-92.
89. Rogers EM. *Diffusion of Innovations*. 4th ed. ed. New York: The Free Press; 1995.
90. Bandura A. *Social foundation of thought and action: A social cognitive theory*. New York: Prentice-Hall; 1986.

91. Azjen I. The theory of planned behaviour. *Organ Behav Hum Dec* 1991;50:179-211.
92. Norman GR, Schmidt HG. The psychological basis of problem-based learning: A review of the evidence. *Acad Med* 1992;67:557-65.
93. Grol R, Wensing M, Hulscher M, Eccles M. Theories on implementation of change in healthcare. In: Grol R, Wensing M, Eccles M, editors. *Improving patient care: The implementation of change in clinical practice*. London: Elsevier; 2004.
94. Curry SJ, Keller PA, Orleans CT, Fiore MC. The role of health care systems in increased tobacco cessation. *Annu Rev Public Health* 2008;29:411-28.
95. Dijkstra R, Wensing M, Thomas R, Akkermans R, Braspenning J, Grimshaw J, Grol R. The relationship between organisational characteristics and the effects of clinical guidelines on medical performance in hospitals, a meta-analysis. *BMC Health Serv Res* 2006;6:doi:10.1186/1472-6963-6-53.
96. Grimshaw J, Eccles M, Thomas R, MacLennan G, Ramsay C, Fraser C, Vale L. Toward evidence-based quality improvement. Evidence (and its limitations) of the effectiveness of guideline dissemination and implementation strategies 1966-1998. *J Gen Intern Med* 2006;21:14-20.
97. Freund M, Campbell E, Paul C, Sakrouge R, McElduff P, Walsh R, Wiggers J, Knight J, Girgis A. Increasing smoking cessation care provision in hospitals: A meta-analysis of intervention effect. *Nic Tob Res* 2009;11:650-62.

98. Jamtvedt G, Young JM, Kristoffersen DT, Thomson O'Brien MA, Oxman AD.
Audit and feedback: effects on professional practice and health care outcomes.
Cochrane Database of Systematic Reviews 2006;Issue 2. Art. No.: CD000259.
DOI: 10.1002/14651858.CD000259.pub2.

Legends

Table 1. Community health service and clinician characteristics

Characteristics	Participants (N=384) n (%)
Service characteristics	
Service type	
Aged care	75 (19.5)
Allied health	109 (28.4)
Community child and family health	39 (10.2)
Community nurses and other nursing services	92 (24.0)
Diabetes	19 (5.0)
Other	50 (13.0)
Remoteness of service (ARIA)	
Major cities	131 (34.1)
Regional/remote towns	253 (65.9)
Clinician characteristics	
Gender	
Female	351 (91.4)
Male	33 (8.6)
Age ^c	
20-29	39 (10.2)
30-39	74 (19.3)
40-49	95 (24.8)
50-59	141 (36.8)
60+	34 (8.9)
Discipline	
Nurses	
Registered nurse	199 (51.8)
Other nurse	57 (14.8)
Allied health	
Psychologist/psychiatrist/counselor	16 (4.2)
Social worker	21 (5.5)
Occupational therapist	37 (9.6)
Physiotherapist	19 (5.0)
Dietitian/Nutritionist	17 (4.4)
Other ^b	18 (4.7)
Years worked in discipline ^c	
2 year or less	13 (3.4)
3-4 years	17 (4.4)
5-9 years	57 (14.9)
10+ years	296 (77.3)
Years worked in community health ^d	
2 year or less	76 (19.9)
3-4 years	57 (14.9)
5-9 years	99 (25.9)
10+ years	150 (39.3)
Employment status ^c	
Full time	196 (51.2)

Part time	165 (43.1)
Casual	20 (5.2)
Other ^c	2 (0.5)
Aboriginal and/or Torres Strait Islander ^c	
Yes	7 (1.8)
No	376 (98.2)
At risk for:	
Smoking ^c	12 (3.1)
Fruit or vegetable under consumption ^c	298 (77.8)
Alcohol overconsumption ^c	153 (40.0)
Physical inactivity ^c	224 (58.5)

^a Other service types include: eg rehabilitation, renal/dialysis

^b Other could include: eg Allied health assistant, speech pathologist, podiatrist, Aboriginal health worker

^c 1 missing value

^d 2 missing values

^e Not specified