



The self-perceived knowledge, skills and attitudes of Australian practice nurses in providing nutrition care to patients with chronic disease

Louise Martin^a, Michael D Leveritt^b, Ben Desbrow^{a,c} and Lauren E Ball^{a,c,*}

^aSchool of Public Health, Griffith University, Gold Coast, ^bSchool of Human Movement Studies, University of Queensland, Brisbane and ^cCentre for Health Practice Innovation, Griffith Health Institute, Gold Coast, Australia.

*Correspondence to Lauren E Ball, School of Public Health, Griffith Health Institute, Griffith University, G40 2.85, Gold Coast Campus, Gold Coast, Queensland 4222, Australia; E-mail: l.ball@griffith.edu.au

Received July 2 2013; revised September 18 2013; Accepted October 7 2013.

Abstract

Background. Nutrition is important for the management of chronic diseases. While practice nurses have numerous roles in primary care, the expectations on practice nurses to provide nutrition care for chronic disease management are increasing. The self-perceived knowledge, skills and attitudes of practice nurses in providing nutrition care has not been widely investigated.

Objectives. The aim of the present study was to investigate the perceptions of Australian practice nurses on the provision of nutrition care for chronic disease management, including specific nutrition-related activities.

Methods. A cross-sectional online survey was completed by 181 Australian practice nurses in 2013. Descriptive analyses were conducted on each survey item. The survey sample was tested for representation of the Australian practice nurse workforce, and associations between respondents' demographic characteristics and responses to survey items were explored.

Results. Almost all practice nurses (89%) felt it was important to address diet whenever they cared for a patient. Over half of practice nurses (61%) were unsure if their practices were effective in increasing patients' compliance with nutritional recommendations. Nearly all practice nurses (98%) perceived further education on nutrition would assist them in their role.

Conclusion. Practice nurses perceive they have an important role and favourable attitudes towards providing nutrition care; however, further training and education to enhance their self-perceived effectiveness is warranted. Future research should clarify whether an increase in nutrition-focused training results in improved effectiveness of nutrition care provided by practice nurses in terms of patient health outcomes.

Key words. Chronic disease, family practice, general practice, nurses, nutrition therapy, nutritional management.

Introduction

Chronic disease is the leading cause of death and disability in Australia and its prevalence is increasing rapidly (1). In the 2004–05 National Health Survey, over 7 million Australians had at least one chronic condition and approximately 55% of people aged 65–84 years had five or more long-term conditions (1). One of the most dominant lifestyle-related risk factors for chronic disease is poor nutrition (2). In Australia, poor

nutrition is highly prevalent. The 2011–12 Australian health survey reported that 90% of respondents were not consuming the recommended vegetable intake and 50% failed to meet the recommended fruit intake for optimal health (1).

The primary health care setting has been identified as an ideal setting for implementing chronic disease management programs, including the provision of nutrition care (3). Nutrition care includes

any practice by a health professional to improve an individual's food-related behaviour and subsequent health outcomes (4). Nutrition care is a component of best practice guidelines for effective chronic disease management and prevention in primary care (5). However only about half of patients receive optimal chronic disease management in the Australian primary health care setting, due in part to ineffective multidisciplinary team work and suboptimal engagement of patients in chronic disease self-management (6).

There is ongoing debate regarding the most effective method to provide nutrition care to patients (7). While GPs and other health care professionals (such as dietitians) are regarded as trusted and reliable sources of nutrition care (8), there are several barriers which limit the efficiency and capacity of these health professionals to provide effective nutrition care to patients with chronic disease. For example GPs report having insufficient time and nutrition education (9,10). In addition, dietitians are a small workforce and have limited opportunities to provide nutrition care under the current chronic disease management funding model in Australia (11).

In Australia, practice nursing is a relatively new and evolving profession compared with practice nursing in other countries such as the UK and New Zealand (12). Australian practice nurses (PNs) are degree-qualified registered nurses or certificate-qualified enrolled nurses who are employed by, or whose services are otherwise retained by, general practices (13). The Australian PN workforce has increased by 150% since 2004 and recognition of the role of PNs in chronic disease management is increasing (14). PNs' involvement in chronic disease management is perceived by patients as acceptable, sustainable and feasible (14). Patients perceive PNs to be highly approachable, trustworthy and reliable health professionals (15). These characteristics are valuable when providing nutrition care, including dietary counselling and nutrition advice (15,16). Furthermore, GPs agree that PNs are a vital part of the primary care team and provide important assistance in chronic disease management (15).

PNs' lifestyle counselling and motivational interviewing skills have previously been investigated internationally (17,18). It was found that while PNs do implement some form of lifestyle counselling, there are several factors such as time and patients' readiness to change, which influence PNs' lifestyle counselling and application of motivational interviewing (17,18). Furthermore, a review by Laurant et al (2004) suggested that in the primary care setting, PNs can deliver comparable health outcomes to GPs, with their chronic disease patients (19). Two recent Australian studies have attempted to explore the role of PNs in the provision of nutrition care (20,21). A recent qualitative study found that PNs perceived their ideal role was to advocate for nutrition and provide a basic level of nutrition care to patients (20). However, the interpretation of the term 'basic' varied between participants; therefore, further understanding of the specific tasks involved in the ideal role of PNs providing nutrition care

is warranted. Similarly, in a survey of 12 PNs, it was found that PNs perceived their role to include basic nutrition care; however, information on specific tasks involved in nutrition care was not investigated (21). Therefore, the specific nutrition-related tasks that PNs should undertake in the context of effective chronic disease management are unclear. Consequently, the aim of the following study was to investigate the perceptions of Australian PNs on the provision of nutrition care for chronic disease management, including specific nutrition-related activities.

Methods

This study was an online cross-sectional survey of Australian PNs using a modified version of a validated tool previously developed to measure the attitudes of physicians towards providing nutrition care in practice (22). The potential participant pool consisted of PNs who worked in the Australian general practice setting between February and April 2013. An invitation to participate was included in e-Newsletters of the major Australian practice nurse associations including the Australian Practice Nurse Association and the Nursing Federation of Australia, and the website of one state-based nursing association. The invitation consisted of a brief description of the study, assurance of confidentiality and a link to complete the survey.

The cross-sectional online survey was developed using LimeSurvey™ version 1.9. The survey was based on a validated tool (22) [Nutrition In Patient care Survey], modified to be relevant to PNs and additional questions requiring investigation were included. For example, the word 'physician' was replaced with 'PN' throughout the survey, and questions relating to continuing professional development (CPD) opportunities were included. Use of the Australian Guide to Healthy Eating (AGTHE) was investigated as these are the evidence-based, overarching standards developed to promote healthy eating and reduce the risk of chronic disease for Australians (23). Online piloting was conducted by 10 individuals for feedback on the interpretation and understanding of survey items. After completion of the survey, the individuals were asked to comment on their interpretation of each survey item as well as the clarity of item wording and survey layout. The recommendations to survey wording included minor word editing which was completed prior to data collection. The finalized survey was intended to take 15 minutes to complete and was only available in English. The final survey consisted of 72 items which were clustered into five sections, each with a distinct rationale for investigation and a variety of response modes (Table 1).

Participants were instructed to respond to each item with regards to the provision of nutrition care to patients living with chronic disease. Section 1 included general demographics and health-related attributes of respondents. Section 2 contained items on the perceived importance of nutrition-related behaviour in each PN's general practice workplace. Section 3 investigated PNs' perceived role and responsibilities to providing physical activity

Table 1. Rationale for survey sections and modes of responses

Section topic	Rationale	Area of enquiry	Response
1. Demographics	Allows indication of representativeness of the sample by a comparison between ABS data of the Australian PN workforce	Age Gender Weight status Tobacco smoking status Physical activity level Number of years being a PN State of residency Highest level of education	MCQ ^a Dichotomous MCQ MCQ MCQ MCQ MCQ MCQ
2. General practice behaviour	Enquired about the perspectives of respondents regarding the importance of varying forms of nutritional care.	For example, how important PNs feel it is to 'assess each patient's fat, fibre, fruit and vegetable intake as a preventative strategy'.	Three-point Likert Scale (important, not important, I'm not sure)
3. Nutrition in routine care	Explored PNs' perceptions on providing nutrition care to patients with chronic disease or risk factors for chronic disease.	For example, 'I have an obligation to improve the health of my patients, including discussing nutrition with them'.	Five-point Likert Scale (strongly disagree, disagree, uncertain, agree, strongly agree)
4. Promoting change to patients	Explored PNs' perceptions regarding counselling, motivational interviewing and patient motivation when it comes to lifestyle change.	For example, 'patients need ongoing counselling to maintain behaviour change'.	Five-point Likert Scale (strongly disagree, disagree, uncertain, agree, strongly agree)
5. Views on CPD	Explored whether PNs believed there were adequate nutrition-related CPD activities	PNs discussed barriers preventing them from attending CPD activities and made suggestions to improve CPD sessions.	Mixture of short-answer responses and multiple choice answers

^aMultiple choice question.

promotion, dietary health promotion and counselling. Section 4 investigated PNs' perceptions regarding their counselling and motivational interviewing skills. The final section examined PNs' views on continuing professional development activities, including any barriers to attending available CPD activities.

All analyses were conducted using the SPSS statistical software package version 19. Descriptive statistics were calculated for each survey item. Age, gender, state of residency and number of years of experience being a PN were compared between survey respondents and the most recent data available on demographics of Australian PNs (24), using chi-square goodness-of-fit analyses to test for representation of the survey sample. Associations between respondents' demographic characteristics and responses to subsequent survey sections were explored using Pearson's chi-square analyses. In order to comply with the assumptions underpinning chi-square analyses, categories were collapsed to ensure that <20% of cells remained below minimum counts. Statistical significance level was set at $P < 0.05$.

Results

A total of 181 PNs responded to the online questionnaire. The demographic characteristics of participants are shown in Table 2.

Importance of nutrition-related tasks

Table 3 outlines PNs' perceived importance relating to nutrition-related tasks in their general practice. The task that was perceived to be most important related to the advocacy of diet and physical activity for weight management. However, each item (apart from the use of food records) was perceived by the majority of PNs as being important in their role.

Perceived roles and responsibilities for nutrition care

Table 4 outlines PNs' opinions relating to the perceived roles and responsibilities within their general practice in relation to managing patients with chronic disease or risk factors for chronic disease. Respondents reported a clear obligation to provide nutrition care; however, there was some variability in their self-perceived capacity and adequacy of training. When providing nutrition care, approximately half of PNs (50.3%) utilized the AGTHE recommendations with most of their patients, while a quarter of PNs utilized the AGTHE with only a small portion (0%–20%) of their patients. Only 10.5% of PNs provided the AGTHE handouts to most (60%–100%) of their patients.

Table 2. Demographic data of responding PNs in Australia (n= 181 PN)

Variable	n (%)	Comparison to Australian PN workforce ^c
Gender		
Female	176 (96.2)	<i>P</i> > 0.05 (representative for gender)
Male	5 (2.8)	
Age group		
<30 years	19 (10.5)	<i>P</i> = 0.001 (study sample: higher proportion of PNs <30 years and >60 years)
30–39 years	26 (14.4)	
40–49 years	55 (30.4)	
50–59 years	64 (35.4)	
≥60 years	17 (9.4)	
Highest level of training		
Hospital-based training	61 (33.7)	–
TAFE certificate	13 (7.2)	
Undergraduate degree	46 (25.4)	
Postgraduate degree	61 (33.7)	
State of residency		
New South Wales	43 (23.8)	<i>P</i> = 0.001 (study sample: over-representation of PNs from Tasmania and South Australia, under-representation of PNs from Victoria).
Queensland	37 (20.4)	
Tasmania	28 (15.5)	
Victoria	25 (13.8)	
South Australia	23 (12.7)	
Western Australia	22 (22.2)	
Australian capital territory	2 (1.1)	
Northern territory	1 (0.6)	
Number of years experience^a		
<3 years	60 (33.1)	<i>P</i> > 0.05 (representative for years of experience)
4–7 years	46 (25.4)	
8–11 years	29 (16.0)	
12–15 years	18 (9.9)	
≥16 years	28 (15.5)	
Physical activity level^b		
Never	14 (7.7)	–
1–2 times	48 (26.5)	
3–4 times	69 (38.1)	
5–6 times	29 (16.0)	
7–8 times	21 (11.6)	
Self-reported weight status		
Underweight	6 (3.3)	–
Healthy weight	97 (53.6)	
Overweight	65 (35.9)	
Very overweight	13 (7.2)	
Smoking status		
Smoker	11 (6.1)	–
Previous smoker	54 (29.8)	
Never smoked	116 (64.1)	

Numbers may not add up to 181 due to incomplete responses. TAFE, Technical and Further Education.

^aThe number of years in which respondents had worked in the general practice setting during their entire career.

^bPhysical activity was determined as the number of times per week respondents completed 30 minutes or more physical activity.

^cComparison to the National PN workforce survey report (20).

Counselling and motivational interviewing skills

Table 5 outlines respondents' perceptions regarding their counselling and motivational interviewing skills for changing patient's behaviour regarding nutrition. Respondents perceived it was

important that patients enhance their nutrition behaviour. However, the majority of PNs (56.4%) were uncertain of their effectiveness and this appeared to be a combination of perceptions of personal effectiveness and external factors such as patient motivation.

Table 3. The importance of nutrition-related tasks (ranked in order of perceived importance)(n = 181 PNs)

	Important n (%)	Unsure n (%)	Not Important n (%)
Advocate a healthy diet and physical activity to promote healthy body weight	164 (97.6)	4 (2.4)	nil
Evaluate patients' alcohol intake as part of their overall nutritional status	158 (94.0)	4 (2.4)	6 (3.5)
Assess each patients physical activity levels as a preventative strategy	152 (90.5)	10 (6.0)	6(3.6)
Address the importance of physical activity whenever I care for a patient	150 (89.3)	11 (6.5)	7 (4.2)
Address the importance of diet whenever I care for a patient	149 (88.7)	12 (7.1)	7 (4.2)
Encourage patients to ask diet-related questions and refer them for additional assistance when warranted	144 (85.7)	16 (9.5)	8 (4.8)
Refer all patients with type 2 diabetes for further dietary counselling	143 (85.1)	17 (10.1)	8 (4.8)
Perform at least some level of nutrition assessment with every patient	143 (85.1)	12 (7.1)	13 (7.8)
Refer patients with diet-related problems to an accredited practising dietician	138(82.1)	16 (9.5)	14 (8.4)
Assess dietary, sodium, potassium, and calcium intake especially among patients at risk for hypertension, osteoporosis or stroke	131 (78.0)	26 (15.5)	11 (6.5)
Assess each patient's fat, fibre, fruit and vegetable intake as a preventative strategy	130 (77.4)	24 (14.3)	14 (8.3)
Counsel patients using principles of motivational interviewing	127 (75.6)	25 (14.9)	16 (9.5)
Assess each patient's stage of change before initiating dietary intervention	127 (75.6)	27 (16.1)	14 (8.3)
Address each patient's weight status in accordance with the World Health Organization's criteria for body mass index	126 (75.0)	16 (9.5)	26 (15.5)
Assess my patient's ability to read a food label	103 (61.3)	37 (22.0)	28 (16.7)
Address each patient's intake of vitamin, mineral and dietary supplements and advice when contraindicated	91 (54.2)	49 (29.1)	28 (16.7)
Request that patients bring a food record with they come in for routine visits	43 (25.6)	45 (26.8)	80 (47.6)

Numbers may not add up to 181 due to incomplete responses.

Continuing education

Nearly all PNs (98%) perceived further education on nutrition would assist them in their role. There were numerous barriers reported by respondents which prevented PNs from attending CPD activities in the past year. The most commonly cited barriers were lack of time, high cost of activities and travel-related issues such as expense and family commitments.

Influence of PN demographics

Overall, there were relatively few question responses that were influenced by demographic characteristics of participants, although some notable associations were identified. For example, a larger proportion of older PNs (>50 years) perceived they had enough knowledge to provide nutrition advice compared with younger PNs (70% versus 51%, $\chi^2 = 5.813$, $P = 0.016$). In addition, experienced PNs (>7 years in practice) were more likely to have attended a nutrition-related CPD activity in their career (78.3% versus 34.2%, $\chi^2 = 26.707$, $P = 0.001$) and in the past year (30% versus 15.2%, $\chi^2 = 4.419$, $P = 0.036$) compared with less experienced PNs. Finally, a higher proportion of PNs who reported being overweight or very overweight felt they lacked sufficient time to provide nutrition care, compared with PNs who reported being a healthy weight or underweight (75% versus 59%, $\chi^2 = 4.393$, $P = 0.036$).

Discussion

The present study investigated the perceptions of Australian PNs on the provision of nutrition care for chronic disease management, including specific nutrition-related activities. This has been the first study to investigate Australian PNs' perceptions of providing nutrition care, using nutrition-related practice examples to obtain a comprehensive insight on PNs' role in providing nutrition care. Overall, PNs perceived nutrition care to be a highly important component of chronic disease management. PNs also felt that it is an important part of their role to provide nutrition care to patients with chronic disease or risk factors for chronic disease. However, PNs felt there are several barriers which limit the provision of nutrition care to patients and were unsure of their effectiveness when providing nutrition care.

Respondents felt that it was their responsibility as a PN to ensure their patients with chronic disease or risk factors for chronic disease receive nutrition care. Despite this enthusiastic attitude, PNs had variable opinions regarding the optimal process by which nutrition care should be provided. This finding supports previous studies which reveal that the definition of 'basic' nutrition care is unclear, making it challenging for PNs to identify their professional roles and responsibilities in this context (20,21). Clarification of the scope of practice of PNs may reduce uncertainty of their role in providing nutrition care and, in turn, enhance their confidence in chronic disease management.

Table 4. Attitudes and beliefs of PNs relating to perceived roles and responsibilities within their general practice in relation to chronic disease management (ranked in order of agreement) (n = 181 PNs)

	Agree or strongly agree ^a n (%)	Unsure n (%)	Disagree or strongly disagree ^b n (%)
I have an obligation to improve the health of my patients including discussing physical activity information with them	146(90.7)	7(4.3)	8(5)
I have an obligation to improve the health of my patients including discussing nutrition information with them	143(88.8)	9(5.6)	9(5.6)
I am knowledgeable on the relationship between nutrition and health	132(82.0)	17(10.6)	31(7.4)
All PNs should counsel high-risk patients about dietary change	126(78.2)	18(11.2)	17(10.6)
Nutrition assessment should be included in any routine appointment, just like diagnosis and treatment	124(77.0)	19(11.8)	18(11.2)
Nutrition counselling should be part of routine care by all PNs	120(74.6)	25(15.5)	16(9.9)
I don't have enough time to provide nutrition advice to every patient	106(65.8)	12(7.5)	53(26.7)
I don't have enough time to promote physical activity to every patient	104(65.8)	12(7.5)	45(28)
I believe I have enough knowledge to provide nutrition advice to patients	96(59.6)	29(18)	36(22.4)
Practice nurses are not adequately paid for time spent counselling patients about nutrition and physical activity	71(59.6)	24(14.9)	41(25.5)
I feel competent in providing nutrition advice using the AGTHE for patients living with chronic disease	95(59.0)	35(21.7)	31(19.3)
Most PNs are not adequately trained to discuss nutrition with patients	85(52.8)	38(23.6)	38(23.6)
Most GPs are not adequately trained to discuss nutrition with patients	62(38.5)	42(26.1)	57(35.4)
Individual PNs have little impact on a patient's ability to lose weight	19(11.8)	20(12.4)	122(75.8)
Nutrition counselling is NOT an effective use of my professional time	10(6.2)	18(11.2)	133(82.6)
Promoting physical activity is NOT an effective use of my professional time	11(6.9)	10(6.2)	140(86.9)
It is a waste of time to counsel patients with poor dietary patterns about nutrition	5(3.1)	8(5.0)	148(91.9)
Preventative health care is boring	4(2.5)	8(5.0)	149(92.5)

Numbers may not add up to 181 due to incomplete responses.

^aCalculated by combining total number in 'Agree' and 'Strongly agree'.

^bCalculated by combining total number in 'Disagree' and 'Strongly disagree'.

Responding PNs felt that it was highly important to perform various practices when providing nutrition care. These nutrition-related practices include: assessing a patient's diet, in particular the macro-nutrients, major food groups and alcohol intake; counselling patients on dietary-related behaviour; and calculating body mass index as a measure of body weight status. In practice, nutrition-related tasks such as these take a considerable amount of time; and time is recognized as a significant barrier for PNs to provide sufficient nutrition care (20,21,25,26). Additionally, other studies have illustrated that administrative and practice-management duties already take up time that may be better spent within consultations (27–30). If some of these administrative tasks could be transferred to, or shared with, other general practice staff members (for example, receptionists or administration assistants) PNs could potentially increase the time with patients, to further implement these practices that constitute nutrition care.

In the current study, most PNs revealed that they did not incorporate the AGTHE guidelines into the nutrition care provided to patients and rarely used the AGTHE resources. These dietary guidelines are evidence-based, overarching standards developed to promote healthy eating and reduce the risk of chronic disease

for Australians (23). It is recommended that the AGTHE is universally employed by health professionals as a guide for basic nutrition advice (23). The AGTHE resources provide an ideal supplement to the large scope of information in the guidelines, and it is unclear why there was a low utilization of the AGTHE resources by PNs. This could be due to a lack of awareness of the guidelines, or PNs may be unsure about their ideal use. Creating an amplified awareness of existing nutrition guidelines throughout general practices and encouraging PNs to use the guidelines may help clarify the nutrition advice PNs could provide to patients. Due to the recent update of the AGTHE guidelines (2013), this study may provide impetus to renew the focus on promoting a healthy diet through evidence-based guidelines.

The PNs in this study were uncertain about the effectiveness of their nutrition care in improving patients' nutrition behaviour and subsequent health outcomes. Uncertainty relating to perceived effectiveness has been identified among other health professionals, particularly GPs (4). In addition, health professionals with low perceived effectiveness in nutrition care are less likely to provide nutrition care to patients (31). Consequently, the finding in the present study indicates this uncertainty relating to PNs'

Table 5. Perceptions of PNs regarding their counselling and motivational interviewing skills for nutrition care (ranked in order of agreement) (n = 181 PNs)

	Agree or Strongly Agree ^a n(%)	Unsure n (%)	Disagree or strongly disagree ^b n (%)
A change toward a healthier lifestyle is important at any stage of life	152(97.4)	2(1.3)	2(1.3)
Patient motivation is essential to achieving dietary change	152(97.4)	1(0.7)	3(1.9)
Specific advice about how to make dietary changes could help some patients improve their eating habits	151(96.9)	3(1.8)	2(1.3)
Patients need ongoing counselling to maintain behaviour changes	146(93.7)	8(5.1)	2(1.2)
My counselling would be more effective if I received further training in this field	131(84.0)	17(10.9)	8(5.1)
Most obese patients want to lose weight but feel frustrated and confused about how to do it	128(82.0)	16(10.3)	12(7.7)
Practice nurses can have an effect on a patient's dietary behaviour if they take the time to discuss the problem	124(79.4)	26(16.7)	6(3.9)
My counselling is more effective when I use motivational interviewing with patients	103(66.1)	46(29.5)	7(4.4)
Patients will change their eating patterns only if faced with a significant health problem (e.g. heart attack)	55(35.0)	24(15.3)	78(49.7)
My patient-education efforts are effective in increasing patients' compliance with nutritional recommendations	49(31.4)	95(60.9)	12(7.7)
Most patients will try to change their lifestyle if I advise them to do so	45(28.8)	80(51.3)	31(19.9)
Patients are not motivated to change unless they are sick	44(28.2)	21(13.5)	91(58.4)
For most patients, health education does little to promote adherence to a healthy lifestyle	31(19.9)	47(30.1)	78(50.0)
After receiving nutrition counselling, patients with poor eating habits will make major changes in their eating behaviour	25(16.0)	88(56.4)	43(27.6)

Numbers may not add up to 181 due to incomplete responses.

^aCalculated by combining total number in 'Agree' and 'Strongly agree'.

^bCalculated by combining total number in 'Disagree' and 'Strongly disagree'.

effectiveness may influence the likelihood of PNs implementing nutrition care and subsequently the consistency of nutrition care provided by PNs. However, two recent intervention-based studies have demonstrated that PNs are comparable to GPs in their effectiveness of chronic disease management and are well received by patients in the overall management of chronic disease programs (32,33). Further efforts are therefore required to enhance PNs' self-efficacy by increasing their awareness of effectiveness and therefore enhance the likelihood of PNs providing nutrition care.

PNs' uncertainty regarding their effectiveness in providing nutrition care may be a result of the commonly reported belief that PNs need further training in order to be more effective (20,25,26,34). Within these studies, the suggested increase in training is anticipated to enhance PNs' nutrition-related knowledge as well as improve their skills in counselling and motivational interviewing (20,25,26,34). The PNs in the current study also reported their effectiveness would be enhanced with further training. It therefore appears that additional nutrition-focused training opportunities is warranted and may benefit PNs in terms of self-perceived effectiveness in providing nutrition care. However, it would be important for future research to clarify whether an increase in nutrition-focused training results in an improvement in the effectiveness of nutrition care provided

by PNs and subsequently the health outcomes of patients. Associations between demographic characteristics and attitudes were relatively weak in the current study, indicating that training based on these associations is not warranted.

Due to the online nature of the convenience sampling utilized in this study, the researchers were unable to calculate the exact response rate. Two major nursing associations were involved in the advertisement of this study, and it was not possible to calculate the number of PNs who saw the advertisement and chose not to participate. Nevertheless, 181 responses were considered to be adequate in order to conduct meaningful analysis. This sample size was also significantly higher than other recent papers investigating nutrition care provided by PNs (20,21). However, some factors may have influenced the findings, such as the online completion of the survey and the over-representation of PNs less than 30 years and PNs aged over 60 years.

In conclusion, the current study investigates the perceptions of Australian PNs on the provision of nutrition care for chronic disease management, including specific nutrition-related activities. The results suggest that PNs perceive to have many of the required skills and favourable attitudes towards providing nutrition care; however, further training and education to enhance their self-perceived effectiveness is warranted. Further research is required to

determine the effectiveness of nutrition care provided by PNs in terms of patient health outcomes. PNs appear to be an ideal workforce to provide nutrition care to patients with chronic disease and this is strengthened by their broad exposure to the population.

Declaration

Funding: none.

Ethical approval: the study protocol was reviewed and approved by the Griffith University Human Research Ethics Committee (Protocol Number PBH/08/13/HREC).

Conflict of interest: none.

References

1. Australian Bureau of Statistics (ABS). *Australian Health Survey: First Results, 2011–2012*. Canberra, Australia: ABS, 2012.
2. Australian Institute of Health and Welfare. *Risk Factors Contributing to Chronic Disease*. Canberra, Australia: Australian Government, 2012.
3. Halcomb EJ, Davidson PM, Yallop J, Griffiths R, Daly J. Strategic directions for developing the Australian general practice nurse role in cardiovascular disease management. *Contemp Nurse* 2007; **26**: 125–35.
4. Ball L, Hughes R, Desbrow B, Leveritt M. Patients' perceptions of nutrition care provided by general practitioners: focus on Type 2 diabetes. *Fam Pract* 2012; **29**: 719–25.
5. Diabetes Australia. *Diabetes Management in General Practice*. Sydney, Australia: Royal Australian College of General Practitioners, 2008.
6. Harris MF, Zwar NA. Care of patients with chronic disease: the challenge for general practice. *Med J Aust* 2007; **187**: 104–7.
7. Australian Institute for Primary Care. *System reform and development for chronic disease management*. Melbourne, Australia: La Trobe University, 2008.
8. Ball L, Desbrow B, Leveritt M. An exploration of individuals' preferences for nutrition care from Australian primary care health professionals. *Aust J Prim Health* 2013 February 22 [Epub ahead of print] doi:10.1071/PY12127.
9. Visser F, Hiddink G, Koelen M, van Binsbergen J, Tobi H, van Woerkum C. Longitudinal changes in GPs' task perceptions, self-efficacy, barriers and practices of nutrition education and treatment of overweight. *Fam Pract* 2008; **25**(suppl 1): i105–11.
10. Ball L, Hughes R, Leveritt M. Nutrition in General Practice: Role and workforce preparation expectations of medical educators. *Australian Journal of Primary Health* 2010; **16**: 304–10.
11. Foster MM, Cornwell PL, Fleming JM *et al*. Better than nothing? Restrictions and realities of enhanced primary care for allied health practitioners. *Aust J Prim Health* 2009; **15**: 326–34.
12. Halcomb EJ, Davidson PM, Salamonson Y, Ollerton R, Griffiths R. Nurses in Australian general practice: implications for chronic disease management. *J Clin Nurs* 2008; **17**: 6–15.
13. Australian Practice Nurses Association. *About General Practice Nursing*. www.apna.asn.au (accessed on 30 June 2013).
14. Hegney DG, Patterson E, Eley DS, Mahomed R, Young J. The feasibility, acceptability and sustainability of nurse-led chronic disease management in Australian general practice: the perspectives of key stakeholders. *Int J Nurs Pract* 2013; **19**: 54–9.
15. Sargent G, Forrest L, Parker R. Nurse delivered lifestyle interventions in primary health care to treat chronic disease risk factors associated with obesity: a systematic review. *Obes Rev* 2012; **13**: 1148–71.
16. Vermunt PW, Milder IE, Wielaard F *et al*. Implementation of a lifestyle intervention for type 2 diabetes prevention in Dutch primary care: opportunities for intervention delivery. *BMC Fam Pract* 2012; **13**: 79.
17. Noordman J, Koopmans B, Korevaar JC, van der Weijden T, van Dulmen S. Exploring lifestyle counselling in routine primary care consultations: the professionals' role. *Fam Pract* 2013; **30**: 332–40.
18. Jansink R, Braspenning J, Laurant M *et al*. Minimal improvement of nurses' motivational interviewing skills in routine diabetes care one year after training: a cluster randomised trial. *BMC Fam Practice*, 2013; **14**: 44.
19. Laurant M, Reeves D, Hermens R *et al*. Substitution of doctors by nurses in primary care. *Cochrane Database of Systematic Reviews* 2004 issue 2. Art. No.: CD001271.
20. Cass S, Ball L, Leveritt M. Australian practice nurses' perceptions of their competency to provide nutrition care to patients living with chronic disease. *Aust J Prim Health* 2013 February 22 [Epub ahead of print] doi:10.1071/PY12118.
21. Mitchell L, Macdonald-Wicks L, Capra S. Nutrition advice in general practice: the role of general practitioners and practice nurses. *Aust J Prim Health* 2011; **17**: 202–8.
22. McGaghie WC, Van Horn L, Fitzgibbon M *et al*. Development of a measure of attitude toward nutrition in patient care. *Am J Prev Med* 2001; **20**: 15–20.
23. National Health and Medical Research Centre. Australian Dietary Guidelines (2013). <http://www.nhmrc.gov.au/guidelines/publications/n55> (accessed on 30 June 2013).
24. Australian General Practice Network. *National Practice Nurse workforce survey report*. Manuka, Australia: ACT, 2009.
25. Hankey CR, Eley S, Leslie WS, Hunter CM, Lean ME. Eating habits, beliefs, attitudes and knowledge among health professionals regarding the links between obesity, nutrition and health. *Public Health Nutr* 2004; **7**: 337–43.
26. Lambe B, Collins C. A qualitative study of lifestyle counselling in general practice in Ireland. *Fam Pract* 2010; **27**: 219–23.
27. Joyce CM, Piterman L. The work of nurses in Australian general practice: A national survey. *Int J Nurs Stud* 2011; **48**: 70–80.
28. Jolly R. *Practice nursing in Australia, in Research Papers Index*. Canberra, Australia: Parliament of Australia, 2007.
29. Pascoe T, Hutchinson R, Foley E, Watts I, Whitecross L, Snowdon T. The educational needs of nurses working in Australian general practices. *Aust J Adv Nurs* 2007; **24**: 33–7.
30. Phillips CB, Pearce C, Hall S *et al*. Enhancing care, improving quality: the six roles of the general practice nurse. *Med J Aust* 2009; **191**: 92–7.
31. Laws RA, Kirby SE, Davies GP *et al*. "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**: 44.
32. Eley DS, Patterson E, Young J *et al*. Outcomes and opportunities: a nurse-led model of chronic disease management in Australian general practice. *Aust J Prim Health* 2013; **19**: 150–8.
33. Morgan MA, Coates MJ, Dunbar JA, Reddy P, Schlicht K, Fuller J. The TrueBlue model of collaborative care using practice nurses as case managers for depression alongside diabetes or heart disease: a randomised trial. *BMJ Open* 2013; **3**: pii: e002171.
34. McCarthy G, Cornally N, Moran J, Courtney M. Practice nurses and general practitioners: perspectives on the role and future development of practice nursing in Ireland. *J Clin Nurs* 2012; **21**: 2286–95.