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Doctors' attitudes and confidence towards providing nutrition care in practice:

Comparison of New Zealand medical students, general practice registrars and general practitioners

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ABSTRACT

INTRODUCTION: Improvements in individuals' nutrition behaviour can improve risk factors and outcomes associated with lifestyle-related chronic diseases.

AIM: This study describes and compares New Zealand medical students, general practice registrars and general practitioners' (GPs) attitudes towards incorporating nutrition care into practice, and self-perceived skills in providing nutrition care.

METHODS: A total of 183 New Zealand medical students, 51 general practice registrars and 57 GPs completed a 60-item questionnaire investigating attitudes towards incorporating nutrition care into practice and self-perceived skills in providing nutrition care. Items were scored using a 5-point Likert scale. Factor analysis was conducted to group questionnaire items and a generalised linear model compared differences between medical students, general practice registrars and GPs.

RESULTS: All groups indicated that incorporating nutrition care into practice is important. GPs displayed more positive attitudes than students towards incorporating nutrition in routine care ($p < 0.0001$) and performing nutrition recommendations ($p < 0.0001$). General practice registrars were more positive than students towards performing nutrition recommendations ($p = 0.004$), specified practices ($p = 0.037$), and eliciting behaviour change ($p = 0.024$). All groups displayed moderate confidence towards providing nutrition care. GPs were more confident than students in areas relating to wellness and disease ($p < 0.0001$); macronutrients ($p = 0.030$); micronutrients ($p = 0.010$); and women, infants and children ($p < 0.0001$).

DISCUSSION: New Zealand medical students, general practice registrars and GPs have positive attitudes and moderate confidence towards incorporating nutrition care into practice. It is possible that GPs' experience providing nutrition care contributes to greater confidence. Strategies to facilitate medical students developing confidence in providing nutrition care are warranted.

KEYWORDS: General practitioner; health knowledge, attitudes, practice; medical education; nutrition therapy

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Introduction

The increasing prevalence of lifestyle-related chronic disease in New Zealand represents an escalating component of health care expenditure.^{1,2} Poor nutrition behaviour is a risk factor for chronic disease, and improvements in individuals' nutrition behaviour can improve risk factors and

outcomes associated with lifestyle-related chronic diseases.³ In this context, nutrition care refers to any practice conducted by a health professional that aims to improve patients' nutrition behaviours and subsequent health.⁴

Internationally, general practitioners (GPs) are viewed as reliable and trusted sources of infor-

mation on nutrition, and patients with chronic disease expect to receive nutrition care from GPs.^{5,6} However, GPs face challenges in providing nutrition care, including perceived inadequate nutrition training and low self-efficacy,⁷ which may be due to insufficient nutrition education, knowledge, skills, or confidence.⁸ The attitudes and confidence of students to provide nutrition care has been suggested to decline after graduation.⁹ However, it is unclear whether this extends to the New Zealand context. In New Zealand, accreditation standards for medical schools specify that graduates must have the ability to apply nutrition knowledge in practice.¹⁰ For GPs, the nutrition syllabus of The Royal New Zealand College of General Practitioners' (RNZCGP) training programme includes competencies that general practice registrars are expected to develop throughout three years of training.¹¹ The RNZCGP competencies relevant to providing nutrition care are presented in Table 1.

The aim of this study was to compare New Zealand medical students', general practice registrars', and GPs' attitudes towards incorporating nutrition care into practice, and self-perceived confidence in providing nutrition care.

Methods

This study utilised a cross-sectional design. A paper-based questionnaire was developed from previous investigations of medical students and GP registrars.¹² Section A contained 30 questions with proven reliability from a Nutrition in Patient Care Survey, which investigated attitudes to nutrition care,¹² and supported by theory focused on attitudes and their influence on behaviour.^{13,14} Question topics included:

1. nutrition assessment
2. nutrition in routine care
3. nutrition recommendations
4. specified practices
5. behaviour change, and
6. patient motivation.

Section B contained 30 questions from a survey with construct validity, which investigated confidence in skills relevant to nutrition care,¹⁵ based

WHAT GAP THIS FILLS

What we already know: The prevalence of lifestyle-related chronic disease is increasing. Poor nutrition behaviour is a risk factor for chronic disease. The expectation on general practitioners (GPs) to provide nutrition care is increasing.

What this study adds: New Zealand medical students, general practice registrars and GPs have positive attitudes towards incorporating nutrition care into practice. Lack of confidence by students and doctors in some areas of nutrition care suggests that strategies to enhance their self-efficacy in these areas of nutrition care may be beneficial.

Table 1. Nutrition care competencies expected of New Zealand general practitioners*

At the completion of vocational training, a registrar is expected to:

- understand the central role of diet and nutrition in causing chronic diseases, excessive weight gain, obesity, Type 2 diabetes, hypertension, cardiovascular diseases, cancer, dental diseases and osteoporosis.
- be confident in advising on nutritional requirements across different age spectrums, including infants, toddlers, teenagers, menstruating women, women pre-conception, during pregnancy and breastfeeding, vegetarians and older patients with an emphasis on encouraging nutrition from 'food first'.
- be confident in appropriate investigation and management of nutritional requirements in specific conditions such as chronic obstructive pulmonary disease, renal impairment, irritable bowel syndrome, coeliac disease, food allergy and food intolerance, severe eczema, migraine, anorexia and bulimia, malnutrition in the elderly, osteoporosis.
- be able to describe a cardio-protective diet, diabetic diet, cholesterol-lowering diet.
- be able to discuss weight loss strategies, dietary and lifestyle advice, use medications appropriately and safely, and know indications for weight loss surgery.
- know the criteria for access to prescription foods for patients on special authority, including infant formulas, gluten-free foods and nutritional supplements.

* Adapted from The Royal New Zealand College of General Practitioners' nutrition syllabus¹¹

on a United States of America (USA) list of priority nutrition topics.¹⁶ Question topics included:

1. nutrition in wellness and disease
2. macronutrients
3. micronutrients
4. women, infants and children, and
5. nutrition in disease management.

Each item was measured using a 5-point Likert scale, where for attitudes, 1=strongly disagree, 2=disagree, 3=uncertain, 4=agree, and 5=strongly agree; and for confidence, 1=not confident, 2=somewhat confident, 3=neutral, 4=confident, and 5=very confident.

Participant medical students were from The University of Auckland Medical School and had finished coursework and placements and were eligible to graduate in 2012 and 2013 (n=351). Participant general practice registrars were first-year registrars attending a training day in Auckland in February 2014 (n=54). Participant GPs were recruited when they attended one continuing medical education (CME) meeting on the topic of nutrition at one of four urban primary health organisations (PHOs) in Auckland. All groups received emailed notification of the study approximately one month and one week prior to data collection, sent by a person not directly involved in the study. Data collection occurred for medical students when the groups returned to university to complete administration tasks; for the general practice registrars, data collection occurred prior to a nutrition session, and for GPs at the beginning of the CME. A larger sample of medical students than GP registrars and GPs was appropriate due to the larger potential participant pool and because approximately 30% of medical students in New Zealand progress to become GPs.¹⁷

Data analysis was conducted using SAS version 9.3. Representativeness of participant groups for age and gender were investigated using Chi-square Goodness of Fit analyses. Descriptive statistics for the Likert scale were calculated for each survey item, collapsed down to three groups. Factor analysis was conducted for group-related

items, allowing meaningful comparison between the three groups of participants. For each group of participants, items within each factor were classified as a binary outcome: 'agreed' (participants reporting 4 or 5) and 'disagreed' (reporting 1 or 2). Data recorded as 'uncertain' (3), were not used in this analysis. The score was given by +1 if their response was agreed and a score of -1 for a disagreed response. The scores were summed and a Generalised Linear Model test performed to determine differences between the three groups. Statistical significance was set at $p \leq 0.05$.

Results

A total of 183 medical students, 51 general practice registrars and 57 GPs completed the questionnaire, resulting in response rates of 52%, 94% and 29%, respectively. Eleven medical students' surveys and one GP survey were removed from the study because of incomplete data. The participant demographic data is presented in Table 2.

Participants' attitudes towards incorporating nutrition care into practice are displayed in Table 3. Overall, all groups displayed positive attitudes towards incorporating nutrition care into practice. GPs were particularly positive towards incorporating nutrition in routine care ($p < 0.0001$) and providing nutrition recommendations ($p < 0.0001$) when compared with students. General practice registrars were particularly positive towards providing nutrition recommendations ($p = 0.004$), specified practices ($p = 0.037$), and eliciting improvements in behaviour change ($p = 0.024$) when compared with students.

All groups displayed very positive attitudes (>90% agreed) for some areas of nutrition care. For example, nearly all participants indicated that

Table 2. Demographic characteristics of participants (n=291)

Group	Gender	Age in years (mean \pm SD)	Comparison with potential participant pool
Medical students	M: 75 (41%) F: 108 (59%)	24.9 \pm 2.4	Representative for age and gender ($p > 0.05$)
General practice registrars	M: 18 (35%) F: 33 (65%)	32.9 \pm 6.5	Representative for age and gender ($p > 0.05$)
GPs	M: 34 (60%) F: 23 (40%)	52.0 \pm 8.3	Representative for gender ($p > 0.05$). Study sample older than national GP workforce ($p = 0.001$)

Table 3. GPs', general practice registrars' and medical students' attitudes towards incorporating nutrition care into practice (n=291)

Items	Group	Mean (SD)	Range	Estimate (95% CI)	P-value
Nutrition assessment (3 items)					
1. Nutrition assessment should be included in any routine appointment, just like any diagnosis and treatment.	GPs	1.789 (1.081)	0–3	0.320 (-0.017–0.656)	0.063
2. Encourage patients to ask diet-related questions and refer for additional assistance when needed.	GP registrars	1.353 (0.934)	0–3	-0.117 (-0.469–0.235)	0.513
3. Perform at least some nutritional assessment with every patient.	Students	1.470 (1.190)	0–3	0	
Nutrition in routine care (6 items)					
1. Address the importance of diet whenever I care for a patient.	GPs	5.228 (1.239)	0–6	0.764 (0.323–1.204)	<0.0001
2. Obligation to improve the health of my patients including discussing nutrition with them.					
3. Nutrition counselling should be part of routine care by all doctors regardless of speciality.	GP registrars	4.902 (1.315)	1–6	0.437 (-0.023–0.898)	0.062
4. All doctors regardless of speciality should counsel high-risk patients.					
5. Patients need ongoing counselling following my initial instruction to maintain behaviour changes.					
6. Advocate diet and activity to promote weight control.	Students	4.464 (1.582)	0–6	0	
Nutrition recommendations (4 items)					
1. Assist paediatric patients to establish healthy eating patterns early to prevent risk of chronic diseases.	GPs	3.281 (0.881)	0–4	0.592 (0.255–0.929)	<0.0001
2. Recommend wherever possible diet changes before initiating drug therapy.	GP registrars	3.216 (0.923)	1–4	0.527 (0.175–0.879)	0.004
3. My patient education efforts will be effective in increasing patients' compliance with nutritional recommendations.					
4. Doctors can have an effect on patients' dietary behaviour if they take the time to discuss the problem.	Students	2.689 (1.243)	0–4	0	
Specified practices (6 items)					
1. Refer patients with diet-related problems to registered dietitians or other qualified nutrition staff.	GPs	4.018 (1.275)	0–6	0.324 (-0.076–0.723)	0.112
2. Specific advice about how to make dietary changes could help some patients improve their dietary habits.					
3. Most patients will change their lifestyle if I advise them to.	GP registrars	4.137 (1.342)	1–6	0.443 (0.026–0.860)	0.037
4. Advocate a low-fat diet for weight control.					
5. Assess each patient's stage of change before initiating drug therapy.					
6. Evaluate each patient's alcohol intake as part of their overall nutrition status.	Students	3.694 (1.356)	0–6	0	
Behaviour change (7 items)					
1. After receiving nutrition counselling patients with poor eating habits will make moderate changes to their eating behaviour.	GPs	3.912 (1.184)	0–6	0.202 (-0.202–0.606)	0.327
2. Patients need specific instructions about how to change their eating behaviour.					
3. Most doctors are not adequately trained to discuss nutrition with patients.	GP registrars	4.196 (1.200)	2–7	0.486 (0.064–0.908)	0.024
4. A change towards a healthier lifestyle is important at any stage of life.					
5. Patient motivation is essential for achieving dietary change.					
6. Assess each patient's intake of vitamins, minerals and dietary supplements.					
7. After receiving nutrition counselling patients with poor eating habits will make major changes in their eating behaviours.	Students	3.710 (1.440)	0–7	0	
Patient motivation (4 items)					
1. Patients will rarely change their behaviour, if they do not have active symptoms of disease.	GPs	1.070 (1.252)	0–4	-0.143 (-0.532–0.246)	0.470
2. Patients will change their eating patterns only if faced with significant health problems (e.g. heart attack).	GP registrars	1.588 (1.359)	0–4	0.375 (-0.031–0.781)	0.070
3. Patients are not motivated to make changes unless they are sick.					
4. Nutrition counselling is not effective use of my professional time.	Students	1.213 (1.302)	0–4	0	

patient motivation is essential to achieving dietary change and that it is important to evaluate alcohol intake as part of patients' overall nutritional status. All groups were less positive (<40% agreed) about specific tasks related to nutrition care, such as performing some nutrition assessment with each patient, and patients' willingness to change lifestyle behaviours.

Nearly all participants indicated that patient motivation is essential to achieving dietary change and that it is important to evaluate alcohol intake as part of patients' overall nutritional status

Participants' confidence towards incorporating nutrition care into practice is presented in Table 4. Overall, all groups displayed moderate confidence towards providing nutrition care. GPs were significantly more confident than students in nutrition in wellness and disease ($p<0.0001$); macronutrients ($p=0.030$); micronutrients ($p=0.010$); and women, infants and children ($p<0.0001$). There were no differences between general practice registrars and students for any factor ($p>0.05$).

All groups reported being confident (>70% agreed) for some areas of nutrition care, such as performing basic nutrition-related skills, including calculating body mass index, and explaining the influence of alcohol consumption on health. All groups were less confident (<40% agreed) in nutrition skills such as listing the kilojoules per gram of protein, carbohydrate and fat and their basic metabolic roles, and describing the role of food constituents in health.

Discussion

This study contributes new information on the attitudes and confidence of medical students, general practice registrars and GPs in providing nutrition care to patients. All groups displayed positive attitudes and moderate confidence towards incorporating nutrition care into practice. General practitioners displayed more positive at-

titudes than students for some areas of nutrition care, whereas general practice registrars displayed more positive attitudes than students in other areas. While GPs reported greater confidence than students in most areas of nutrition care, there were no differences identified in confidence towards providing nutrition care between general practice registrars and students.

The perception that nutrition care is important is supported by international literature that has studied attitudes of students, doctors and educators to providing nutrition care.^{4,9,15} Previous literature from the USA suggesting that medical students' attitudes towards nutrition care decline after graduation⁹ was not supported in the present study where, overall, GPs placed greatest importance on nutrition care. Similarly to the findings of international studies,^{9,15} the participants in this study reported being more confident to discuss the role of nutrition in health and disease than to explain the nutrient composition of foods to patients.

General practitioners reported greatest confidence about providing nutrition care, which may be related to their greater experience in this area. However, the increasing focus on multidisciplinary approaches to patient care in tertiary and postgraduate education¹⁸ may have impacted on general practice registrars' perceived role in this area. Further information on New Zealand GPs' nutrition care practices and the influence of these practices on patients' health care outcomes is needed.

Limitations

Despite differences in response rates, all groups were representative for age and gender, aside from GPs, who were older than the national workforce.¹⁹ Many GPs would have trained prior to the inclusion of the nutrition syllabus within the GP curriculum, which may have influenced their nutrition knowledge. It is also possible that GPs who attended the CME meetings were already interested in nutrition, and this may have resulted in more favourable responses. Furthermore, this study relates to one large urban area in New Zealand and there is a need for caution in generalising the results. Finally, ideally a

Table 4. GPs', general practice registrars' and students' confidence towards incorporating nutrition care into practice (n=291)

Items	Group	Mean (SD)	Range	Estimate (95% CI)	P-value
Wellness and disease (5 items)					
<ol style="list-style-type: none"> Overall benefits of aerobic exercise on health and wellbeing. Strategies for osteoporosis prevention, including nutrition and lifestyle. Significance of modest weight loss for patients with Type 2 diabetes. Definition of moderate alcohol consumption and its role in health and disease. Role of water and hydration in health and fluid needs on activity level and age. 	GPs	3.491 (0.735)	1–4	0.896 (0.552–1.240)	<0.0001
	GP registrars	2.863 (1.149)	0–4	0.267 (-0.092–0.626)	0.144
	Students	2.596 (1.254)	0–4	0	
Macronutrients (5 items)					
<ol style="list-style-type: none"> Role of dietary cholesterol and saturated fats in elevating blood lipids. Assessing total kilojoules and saturated fat per portion of food by using the food label. Kilojoules per gram of protein, carbohydrate and fat and their basic metabolic roles. Avoidance of cross contamination when preparing and storing foods. Examples of serving size of meat or dairy from the Ministry of Health serving guide. 	GPs	2.614 (1.278)	0–5	0.488 (0.049–0.928)	0.030
	GP registrars	2.275 (1.297)	0–5	0.149 (-0.310–0.607)	0.524
	Students	2.126 (1.569)	0–5	0	
Micronutrients (9 items)					
<ol style="list-style-type: none"> Indications for the use of single vitamins (i.e. B, C, E) or multivitamin supplements. Scientifically confirmed benefits of St John's Wort and echinacea. Role of omega-3 and omega-6 fatty acids in heart health. Generalised mechanism for the probiotic use of yoghurt and acidophilus. Means of identifying antioxidant-rich food while grocery shopping. Role of food constituents in health (phytonutrients, dietary fibre, soy etc). Nutrition concerns of patients with GI intolerances, maldigestion or absorption. Reported risks of high-protein diets such as Atkins diet. Potentially harmful interactions of medications with herbal or botanical supplements. 	GPs	3.491 (2.399)	0–8	0.950 (0.230–1.670)	0.010
	GP registrars	2.569 (2.193)	0–7	0.028 (-0.724–0.779)	0.942
	Students	2.541 (2.471)	0–9	0	
Women, infants and children (6 items)					
<ol style="list-style-type: none"> Maternal and infant benefits and challenges anticipated with breastfeeding. Interpretation of growth chart tables and pertinent trends for a child with failure to thrive. Advice on feeding an infant with colic; breast versus soy formulas. Common nutrient deficiencies of adolescent women. Calculating the body mass index (BMI) and waist–hip ratio based on gender. Role of genetics, diet and pharmacology in weight loss regimens. 	GPs	4.404 (1.474)	0–6	1.092 (0.578–1.606)	<0.0001
	GP registrars	3.608 (1.372)	1–6	0.296 (-0.241–0.833)	0.278
	Students	3.311 (1.874)	0–6	0	
Disease management (5 items)					
<ol style="list-style-type: none"> Recommended dietary patterns for patients with non-insulin-dependent diabetes. Recognising warning signs and symptoms of patients with eating disorders. Recognition of nutritional risk in elderly patients. Nutrition strategies for persons losing weight due to chronic cachexia. Indications and contraindications for enteral and parenteral nutrition. 	GPs	2.877 (1.415)	0–5	0.484 (-0.015–0.982)	0.057
	GP registrars	2.314 (1.516)	0–5	-0.080 (-0.600–0.441)	0.763
	Students	2.393 (1.778)	0–5	0	

GI Gastrointestinal

prospective cohort study design would have enabled an investigation of changes in attitudes and confidence in a single group rather than in three disparate groups.

Final comments

In conclusion, New Zealand medical students, general practice registrars and GPs have positive attitudes towards incorporating nutrition care into practice. Lack of confidence by all participants in some areas of nutrition care suggests that strategies to enhance GPs' self-efficacy in these areas of nutrition care may be beneficial.

References

1. Ministry of Health. The health of New Zealand adults 2011/12. Wellington, New Zealand: Ministry of Health; 2012.
2. National Health Committee. Meeting the needs of people with chronic conditions. Wellington, New Zealand: National Health Committee; 2007.
3. World Health Organization (WHO). WHO Technical Report Series 916: Diet, nutrition, and the prevention of chronic diseases. Geneva:WHO; 2003.
4. Ball LE, Hughes RM, Leveritt MD. Nutrition in general practice: role and workforce preparation expectations of medical educators. *Aust J Prim Health*. 2010;16(4):304–10.
5. Brotons C, Drenthen AJ, Durrer D, Moral I; European Network on Prevention and Health Promotion (EUOPREV). Beliefs and attitudes to lifestyle, nutrition and physical activity: the views of patients in Europe. *Fam Pract*. 2012;29:i49–i55.
6. Johansson K, Bendtsen P, Akerlind I. Advice to patients in Swedish primary care regarding alcohol and other lifestyle habits: how patients report the actions of GPs in relation to their own expectations and satisfaction with the consultation. *Eur J Public Health*. 2005;15:615–20.
7. Darer JD, Hwang W, Pham HH, Bass EB, Anderson G. More training needed in chronic care: a survey of US physicians. *Acad Med*. 2004;79(2):541–8.
8. Nicholas L, Pond C, Roberts D. Dietitian-general practitioner interface: a pilot study on what influences the provision of effective nutrition management. *Am J Clin Nutr*. 2003;77(Suppl):1039S–42S.
9. Vetter ML, Herring SJ, Sood M, Shan NR, Kalet AL. What do resident physicians know about nutrition? An evaluation of attitudes, self-perceived proficiency and knowledge. *J Am Coll Nutr*. 2008;27(2):287–98.
10. Medical Deans Australia and New Zealand, Health Workforce Australia. Medical Graduate Competency Framework Stage 2: Final Report. Sydney, Australia: Medical Deans' Competencies Project; 2012.
11. The Royal New Zealand College of General Practitioners. Nutrition GPEP Syllabus 2012. Wellington: Royal New Zealand College of General Practitioners; 2012.
12. McGaghie W, Van Horn L, Fitzgibbon M, Telser A, Thompson J, Kushner R, et al. Development of a measure of attitude toward nutrition in patient care. *Am J Prev Med*. 2001;20(1):15–20.
13. Ajzen I, Fishbein M. Understanding attitudes and predicting social behaviour. Englewoods Cliffs, NJ: Prentice Hall; 1980.
14. Petty RE, Wegener DT, Fabrigar LR. Attitudes and attitude change. *Annu Rev Psychol*. 1997;48:609–47.
15. Mihalynuk TV, Scott CS, Coombs J. Self-reported nutrition proficiency is positively correlated with perceived quality of nutrition training of family physicians in Washington State. *Am J Clin Nutr*. 2003;77:1330–6.
16. Weinsier RL, Boker JR, Brooks CM, Kushner RF, Visek WJ, Mark DA, et al. Priorities for nutrition content in a medical school curriculum: a national consensus of medical educators. *Am J Clin Nutr*. 1989;50(4):707–12.
17. Poole P, Bourke D, Boaz S. Increasing medical student interest in general practice in New Zealand: Where to from here? *N Z Med J*. 2010;123(1315):12–9.
18. Kushner R, Van Horn L, Rock C, Edwards M, Bales C, Kohlmeier M, et al. Nutrition education in medical school: a time of opportunity. *Am J Clin Nutr*. 2014;99(5 Suppl):1167S–73S.
19. New Zealand Medical Association. An analysis of the New Zealand general practitioner workforce—update 2009. Wellington, New Zealand: New Zealand Medical Association; 2009.

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COMPETING INTERESTS

None declared.