“Not just personal training”

Investigating the Provision of Nutrition Care by Personal Trainers in Australia

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Abstract

Poor dietary behaviours and physical inactivity are prevalent modifiable risk factors for chronic disease. Fitness professionals, such as personal trainers, provide individualised exercise prescription for healthy individuals. National and international scopes of practice highlight that personal trainers should provide nutrition care in line with national dietary guidelines. Nutrition care is considered as any interaction between a professional and a client that facilitates changes in a dietary behaviour. However, the role of personal trainers in providing nutrition care has been controversial and largely unstudied.

Professionals within and outside the fitness industry have identified the provision of nutrition care beyond the recommended scope of practice as an industry risk. Nutrition care beyond the national dietary guidelines may lead to poor health outcomes for clients. While it is apparent that personal trainers provide nutrition care beyond the national dietary guidelines; it is unclear if this occurs intentionally or if it arises secondary to implementing changes in exercise behaviours. As such, this research employed the PRECEDE steps of the PRECEDE-PROCEED framework to systematically explore environmental and behavioural factors that influence personal trainers to provide nutrition care beyond their scope of practice. A programmatic approach to research was also applied so that each study informed the next.

Study one investigated the intention of fitness businesses to provide nutrition care through a review of advertised services on fitness business websites. This study confirmed that personal trainers are advertised as able to provide care beyond their scope of practice. Study two used an online survey to investigate client expectations in regards to nutrition care from personal trainers. Most respondents expected personal trainers to provide nutrition care and be knowledgeable on a range of nutrition topics, some of which extend beyond the scope of practice for personal trainers. Study three used a validated online tool to measure self-
perceived competence of personal trainers to provide nutrition care. Overall, personal trainers were confident in their ability and showed favourable attitudes towards providing nutrition care to clients. Study four explored the context in which personal trainers provide nutrition care through in-depth interviews with personal trainers practising in Australia. All personal trainers reported providing nutrition care and claimed that nutrition care was an important component of their role. Still, many were unaware of their scope of practice regarding nutrition care and described a gap between the nutrition education they had received and their perceived nutrition role. Study five explored the regulatory environment of personal training through a review of international education and occupational standards. Educational and occupational standards varied widely between countries, and within countries, suggesting minimal alignment with the international standards.

Collectively, these studies highlighted numerous behavioural and environmental issues that contribute to personal trainers providing nutrition care beyond their recommended scope of practice. The behaviour of personal trainers providing nutrition care beyond their recommended scope of practice has been enabled by positive attitudes and behavioural beliefs regarding the provision of nutrition care. Environmental issues including regulatory weaknesses and social expectations facilitate the provision of nutrition care beyond the recommended scope of practice for registered fitness professionals. Future efforts should be directed towards developing and assessing clear role statements for personal trainers to provide nutrition care, including specific nutrition-related knowledge and skills required for safe and effective practice. The acceptability, feasibility, and interpretation of these role statements should be tested among key stakeholders. Ultimately this may support personal trainers to provide safe and effective nutrition care that will support optimal health of their clients.
Statement of Originality

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, this document contains no material previously published or written by another person except where due reference is made in the thesis itself.

(Signed): Katelyn Barnes  
(Date): 12/06/2017
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Acknowledgement of Papers included in this Thesis

Included in this thesis are papers in Chapters 4, 5, 6, 7, and 8 which are co-authored with other researchers. The candidate’s contribution to each co-authored paper is outlined at the front of the relevant chapter. The bibliographic details for these papers including all authors are:

Chapter 4


Chapter 5


Chapter 6

Barnes, K., Desbrow, B., & Ball, L. (2016). Personal trainers are confident in their ability to provide nutrition care: a cross-sectional investigation. Public Health, 140:39-44.

Chapter 7


Chapter 8


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Poor dietary behaviours and physical inactivity are modifiable risk factors for chronic diseases \textsuperscript{1,2}. Many countries have guidelines that outline optimal dietary and physical activity behaviours for population groups to promote health and reduce the social and economic burden of chronic disease \textsuperscript{3}. However, the prevalence of poor dietary behaviours and physical inactivity is considerable in many countries. For example, the majority of adults in the USA, UK and Australia consume less fruit and vegetables than recommended \textsuperscript{4-6} and more than half of adults fail to meet the recommended levels of physical activity \textsuperscript{7-9}. Clearly, strategies that simultaneously support adults to improve their dietary behaviours and increase physical activity levels are important to promote optimal health and prevent chronic disease.

“Nutrition care” refers to any practice conducted by a professional in an attempt to improve an individual’s dietary behaviours \textsuperscript{10}. Similarly, this thesis defines “exercise care” to include any practice conducted by a professional in an attempt to improve an individual’s physical activity behaviours. In Australia, numerous health professionals are consulted for nutrition or exercise care \textsuperscript{11,12}. Dietitians and exercise physiologists receive specialist training to safely and effectively provide individualised nutrition and exercise care, respectively, to a wide range of population groups \textsuperscript{13-15}. However, due to the current medical and public health policy environment, dietitians and exercise physiologists are most often consulted for chronic disease management as opposed to prevention \textsuperscript{16,17}. Furthermore, the dietetics and exercise physiology workforces are small with less than 1 professional per 4000 Australians \textsuperscript{18-20}. As such, there is a need for workforce roles with a preventative health focus to address both nutrition care and exercise care.
The personal trainer workforce has potential to play a key role in the prevention of chronic disease for several reasons\textsuperscript{21, 22}. Firstly, it is a large workforce (1 personal trainer per 1000 Australians) already engaged in the provision of exercise care\textsuperscript{21, 23}. Secondly, individuals who are attempting to improve their exercise behaviours by consulting with a personal trainer are likely to seek advice on other health topics, such as dietary behaviours\textsuperscript{24, 25}. Thirdly, clients of personal trainers report holding the advice of their trainer in high regard\textsuperscript{26, 27}. Finally, the provision of nutrition care in line with the national dietary guidelines is within the recommended scope of practice for personal trainers internationally and in Australia\textsuperscript{28, 29}. Clearly, fitness professionals such as personal trainers\textsuperscript{*} could be engaged to provide basic nutrition and exercise care to facilitate improvements in dietary and physical activity behaviours, thereby reducing the risk of chronic disease in Australia.

Recent research has indicated that personal trainers provide nutrition care beyond their recommended scope of practice\textsuperscript{30-32}. This has raised concerns within and external to the fitness industry regarding the appropriateness, competence and safety of personal trainers providing nutrition care\textsuperscript{33-36}. Still, there appears to be ample opportunity for personal trainers to facilitate improvements in physical activity and dietary behaviours that may help to enhance the health of clients and reduce their risk of chronic disease\textsuperscript{21, 22}. The nutrition care provided by personal trainers and the factors that influence nutrition care in the fitness industry environment have not previously been explored. As such, the aim of this thesis was to explore nutrition care provided by Australian personal trainers and the factors which influence the provision of nutrition care beyond the recommended scope of practice for registered fitness professionals.

\textsuperscript{*}Throughout this thesis, the terms ‘fitness professional’ and ‘exercise professional’ are used interchangeably to refer to individuals who deliver exercise care within the fitness industry. Personal trainers are a specific group within the fitness or exercise professional workforce.
Chapter 2

Literature review

2.1 Preface

Poor dietary and physical activity behaviours are two modifiable risk factors for chronic disease that are estimated to contribute to 10% of the global burden of disease \(^1\). Clearly, strategies to improve diet and physical activity of individuals are likely to have a significant impact on public health. Personal trainers are well placed to facilitate improvements in physical activity and dietary behaviours of individuals. However, there has been limited research into the potential capacity of personal trainers to provide healthcare.

To orient the readers to the problem, this chapter presents a narrative literature review. The first two sections cover current attempts by health practitioners to provide nutrition and exercise care to individuals at risk of chronic disease including a review of the national dietary and physical activity guidelines and the current provision of care from health professionals. The subsequent two sections highlight the potential of personal trainers to contribute to chronic disease prevention and health promotion work and critically review the roles, regulations and qualifications of personal trainers in Australia with regard to nutrition care. The final section of this chapter summarises the current evidence of nutrition care provided by personal trainers, both in Australia and internationally, and presents the thesis aims.
Peer reviewed journals were identified through PubMed, ISI Web of Knowledge, ProQuest, ERIC, and CINAHL. Combinations of search terms for Section 2.2 included terms analogous with “chronic disease”, obesity, overweight, Australia, global, guidelines, nutrition, physical activity, intervention, “health professional”, and impact. Search terms for Sections 2.3 and 2.4 included combinations of the following terms: “personal trainer” OR “fitness trainer” OR “fitness professional” OR “exercise professional” OR “exercise leader” OR “exercise trainer” AND nutrition OR diet*, AND advice, AND “scope of practice” OR guidelines, AND health. Cross-referencing and forward citation searches were used in all sections to reach literature saturation. Industry and regulatory information was sourced through grey literature including government reports (Australian and international) as well as fitness industry organisations (e.g. Fitness Australia). International sources of information were used to compare to Australian information and to support areas of research where the Australian evidence is limited. Searches were conducted from October 2014 through to February 2017. Research articles and grey literature presented in languages other than English were excluded from this review.

2. 2 Chronic disease and modifiable risk factors

Chronic disease imposes a large burden worldwide. Unlike infectious diseases, chronic diseases cannot be passed between individuals. Characteristics of chronic disease include complex aetiologies, multiple risk factors, a prolonged course of illness and functional impairments or disability. Approximately two thirds of global deaths in 2010 were related to chronic disease. In Australia, more than 90% of deaths are attributable to chronic disease and over 35% of the population suffer one or more chronic diseases. This results in chronic diseases contributing in excess of $2.5 billion (AUD) of avoidable health expenditure each year in Australia. Understandably, reducing the burden of chronic diseases has
attracted considerable attention and many chronic diseases are listed as Australian national health priority areas.\(^\text{37}\)

Primary modifiable risk factors for the development of chronic disease include poor dietary behaviours and sedentary lifestyles.\(^\text{1, 2}\) These risk factors combined account for 10% of the global burden of disease.\(^\text{1}\) Excess energy intake not expended through physical activity can lead to a gradual increase in body fat, resulting in weight gain.\(^\text{1, 39}\) Excess body weight is used as a proxy indicator of body fat and is recognised as a risk factor for chronic disease.\(^\text{2}\) Body weight is considered excessive when the Body Mass Index (BMI) of an individual exceeds the healthy range of 18.5-24.9 kg/m\(^2\). More than 63% of Australian adults carry excess body fat with 35% of Australian adults classified as overweight and a further 28% as obese.\(^\text{9}\) Clearly, reducing the burden of chronic disease requires strategies that support both healthy dietary behaviours and regular physical activity.

### 2.2.1 Identifying guidelines and adherence for dietary intake and physical activity

Guidelines outlining appropriate dietary behaviours and physical activity recommendations for populations which are designed to promote optimal health and prevent chronic disease exist in most countries.\(^\text{3, 41}\) In Australia, national guidelines have been developed for both physical activity and dietary behaviours.\(^\text{42, 43}\)

The latest Australian national guidelines for physical activity were released in 2012.\(^\text{42, 44}\) These guidelines emphasise the importance of undertaking any physical activity to prevent chronic disease. The guidelines differentiate between physical activity recommendations for infants, young people, adults and older adults.\(^\text{44}\) Table 1 summarises the current Australian Physical Activity and Sedentary Behaviour Guidelines for Adults (aged 18-64 years).
Table 1: Summary of the Physical Activity and Sedentary Behaviour Guidelines for Australian Adults aged 18 to 64 years

<table>
<thead>
<tr>
<th>Guideline for Physical Activity</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doing any physical activity is better than doing none. If you currently do no physical activity, start by doing some, and gradually build up to the recommended amount.</td>
<td>• Start slowly and gradually increase the amount you do.</td>
</tr>
</tbody>
</table>
| Be active on most, preferably all, days every week. | • Park further away from your destination and walk.  
• Take the stairs instead of the lift. |
| Accumulate 150 to 300 minutes (2 ½ to 5 hours) of moderate intensity physical activity or 75 to 150 (1 ¼ to 2 ½ hours) of vigorous intensity activity, or equivalent combination of both moderate and vigorous activities each week. | • Walking  
• Swimming  
• Dancing  
• Tennis/Squash  
• Yoga/Pilates |
| Do muscle strengthening activities on at least 2 days each week. | • Body weight exercises like squats, push-ups, sit-ups and lunges can be done at home or work. |
| Minimise the amount of time spent in prolonged sitting and break up long periods of sitting as often as possible. | • Stand while you read at work.  
• Set a timer on your television to turn off after an hour to remind you to get up and move more. |

Adapted from the Australian Physical Activity and Sedentary Behaviour Guidelines 42.

Many Australians do not meet these recommended physical activity guidelines. Approximately 45% of Australian adults were classified as “insufficiently active” (not accumulating a minimum of 150 minutes of moderate physical activity per week) in 2014-15 9. Inadequate physical activity is concerning as it is a prevalent modifiable risk factor for chronic disease 1. As such, strategies that support Australian adults to undertake physical activity are required to help maximise the benefits associated with regular physical activity and assist in the reduction of chronic disease. Evidence supports that improving a combination of dietary and physical activity behaviours is effective for promoting optimal health and for chronic disease prevention 1,3. The research in this thesis focused on nutrition.
and dietary behaviours of physically active individuals and those attempting to improve their physical activity to be more closely aligned with the physical activity guidelines.

The Australian dietary guidelines include five general statements and specific Nutrient Reference Values which help to identify dietary behaviours that facilitate optimal health and prevent chronic disease. The five general statements address appropriate dietary behaviours such as “Enjoy a wide variety of nutritious foods from the five food groups each day”. The five general statements are not specific enough to guide dietary intake for optimal health and disease prevention. The Nutrient Reference Values (NRVs) are specific, scientifically calculated daily values for key macro and micro nutrients. The NRVs include a subcategory, Suggested Dietary Targets (SDTs), which are estimated nutrient levels linked to evidence for the prevention of chronic disease. SDTs are stated for several nutrients with variation for gender and different stages of the life cycle. However, both the general statements and NRVs require translation for use by members of the public as neither describes how much of a certain food should be consumed to reach targets to support health and prevent chronic disease.

The Australian Guide to Healthy Eating was developed to reflect how best to achieve the five general statements and the NRVs in practical terms. The Guide specifies five food groups including: breads, grains and cereals; vegetables; fruits; dairy or dairy alternatives; and meats or meat alternatives. Foods high in fats, oils, salt, sugar and alcohol are classified as discretionary items. The Guide uses pictures and placement of foods to describe recommended daily portions of each food group and culturally appropriate foods within each group. In addition, text is included to describe recommended quantities of different foods for consumption using standard cooking measurements (grams, cups, spoons). Optimal amounts of each food group have been formulated for each gender and for different stages of
the lifecycle. The recommended quantity (serves) of each food group for Australian adults aged 18 to 50 years is displayed below in Table 2.

Table 2: Summary of the Australian Guide to Healthy Eating for Australian Adults Aged 18 to 50 years

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Recommended serves (Adults 18-50)</th>
<th>Example Serving size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breads and Cereals (Wholegrain preferred where possible)</td>
<td>Males: 9 Females: 6</td>
<td>• 1 slice (40g) bread</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ½ cup (75-120g) cooked rice, pasta, noodles, barley, buckwheat, semolina, polenta, bulgur or quinoa</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ½ cup (120g) cooked porridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2/3 cup (30g) wheat cereal flakes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ¼ cup (30g) muesli</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 small (35g) English muffin or scone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Approx. 75g:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ½ cup cooked green or orange vegetables (for example, broccoli, spinach, carrots or pumpkin)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ½ cup cooked dried or canned beans, peas or lentils (preferably with no added salt)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 cup green leafy or raw salad vegetables</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ½ cup sweet corn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ½ medium potato or other starchy vegetables (sweet potato, taro or cassava)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 medium tomato</td>
</tr>
<tr>
<td>Vegetables</td>
<td>Males: 6 Females: 5</td>
<td>• 1 medium apple, banana, orange or pear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2 small apricots, kiwi fruits or plums</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 cup diced or canned fruit (no added sugar)</td>
</tr>
<tr>
<td>Fruits</td>
<td>Males: 2 Females: 2</td>
<td>• 1 cup (250ml) fresh, UHT long life, reconstituted powdered milk or buttermilk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ½ cup (120ml) evaporated milk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 2 slices (40g) or 4 x 3 x 2cm cube (40g) of hard cheese, such as cheddar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ½ cup (120g) ricotta cheese</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ¾ cup (200g) yoghurt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 cup (250ml) soy, rice or other cereal drink with at least 100mg of added calcium per 100ml</td>
</tr>
<tr>
<td>Meats and Meat Alternatives</td>
<td>3</td>
<td>2.5</td>
</tr>
<tr>
<td>----------------------------</td>
<td>---</td>
<td>-----</td>
</tr>
<tr>
<td>● 65g cooked lean red meats such as beef, lamb, veal, pork, goat or kangaroo (about 90-100g raw)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● 80g cooked lean poultry such as chicken or turkey (100g raw)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● 100g cooked fish fillet (about 115g raw) or one small can of fish</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● 2 large (120g) eggs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● 1 cup (150g) cooked or canned legumes/beans such as lentils, chick peas or split peas (preferably with no added salt)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● 170g tofu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● 30g nuts, seeds, peanut or almond butter or tahini or other nut or seed paste (no added salt)*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discretionary foods</th>
<th>0-3</th>
<th>0-2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>● 1 standard drink</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● 12 fried hot chips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● 1 tablespoon butter or margarine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● 2 sweet biscuits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● ½ a small chocolate bar</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adapted from the *Eat for Health: Australian Dietary Guidelines* 43.

According to two non-consecutive 24 hour food recalls, few Australians report a dietary intake that aligns with the Australian Guide to Healthy Eating 6. Only 7% of Australians meet the recommended intake of vegetables and less than 50% of Australians meet the recommended intake of fruits 6. More than one-third of daily energy intake comes from discretionary foods 6. Low intake of nutrient rich foods, such as fruits and vegetables, combined with high intake of discretionary items has been linked with the development of chronic disease 1. Clearly, the dietary behaviours of Australians could be improved to maximise the benefits associated with a well-balanced diet and to help decrease the risk of chronic disease.
2.3 Nutrition care and exercise care

2.3.1 Defining nutrition care and exercise care

Nutrition care refers to any practice conducted by a professional in an attempt to facilitate an improvement of dietary behaviours for an individual. This could involve a range of interactions about food, from a reminder to eat healthy foods through to the development of a medical nutritional intervention plan. Similarly, this thesis defines “exercise care” as any practice conducted by a professional in an attempt to facilitate an individual improving their physical activity behaviours. This could involve a range of interactions about physical activity, from an encouragement or prompt to participate in regular activity through to the prescription of a physical activity plan.

A combination of healthy dietary behaviours and exercise is needed for optimum health, weight management and prevention of chronic disease. Nutrition care and exercise care therefore present opportunities for professionals to facilitate improvements in Australian adult dietary and physical activity behaviours. As such, the ability and capacity to provide effective nutrition care and exercise care to the Australian population warrants investigation.

2.3.2 Competence to provide nutrition care and exercise care

The ability to conduct a task effectively is referred to as competence and is judged against an established standard that is desirable for safe professional practice. Competencies are measurable aspects of knowledge, skill or attitudes related to the completion of set tasks. Competency is taught and defined through practice, social context, professional interactions and education. Overall, a competent professional can demonstrate the ability to safely and effectively apply a range of knowledge, skills and attitudes applicable to a specific profession and at a level appropriate to that profession.
Competence to provide nutrition care is challenging to define due to the wide range of interactions that the term encompasses. Yet all nutrition care should be based on knowledge of the available scientific evidence. For example, basic nutrition care, requiring basic nutrition competence, may include knowledge of the Australian dietary guidelines and common foods within the dietary guidelines. In contrast, complex nutrition care, for the management and treatment of chronic disease in individuals, requires a thorough understanding of scientific evidence for metabolic, cellular and digestive processes as well as developed skills in nutrition assessment and counselling.

Similar to nutrition care, competence in providing exercise care encompasses a wide range of possible interactions. All exercise care should be based on knowledge of the available scientific evidence. For example, basic exercise care may require knowledge of the physical activity and sedentary behaviour guidelines and of common ways to increase physical activity behaviours. Complex exercise care may be used for the individual management and treatment of chronic disease or injury which requires an in depth understanding of biomechanics, physiology and anatomy.

### 2.3.3 Current workforce capacity for nutrition care and exercise care

Improving dietary and physical activity behaviours of individuals is likely to decrease the incidence of chronic disease in Australia. Ideally, university trained health professionals deemed competent in providing individualised care, such as Accredited Practising Dietitians (APDs) and Accredited Exercise Physiologists (AEPs), would be available to assess, prescribe and monitor the dietary behaviours and physical activity behaviours of Australians, respectively. However, both professions are relatively small with around 1 APD per 4000 Australians and 1 AEP per 5000 Australians. Both APDs and AEPs are specifically trained in therapeutic and rehabilitative care, which may reduce capacity for preventative care.
In reality, a variety of health professionals are consulted for generic nutrition and exercise care, the result of dietary behaviours and physical activity behaviours being linked to health. As such, all health professionals are expected to play an important role in providing nutrition and exercise care. Nutrition care and exercise care from doctors, nurses and allied health professionals have been investigated. Australians report that they want to receive nutrition care from their regular health professional, yet health professionals often do not provide nutrition care due to a lack confidence and low perceived effectiveness. As such, an exploration of nutrition care from other health-related professionals is warranted.

Personal trainers provide personalised exercise prescription and motivation to undertake physical activity. When an individual attempts to improve their own physical activity behaviours (for example, by engaging with a personal trainer), a ‘spill over’ motivational effect is often noted and they appear more likely to seek advice on other health behaviours including diet. Personal trainers receive basic nutrition education and have industry support to provide nutrition care in line with national guidelines. As such, personal trainers have been identified through public health research as ideally placed to provide a combination of exercise and nutrition care, warranting further investigation into their ability to provide this care.

### 2.4 Personal trainer workforce

Personal trainers may work in a variety of settings to provide personalised exercise prescription, demonstration, instruction and motivation for individuals or groups. The role of personal trainers originated from within the body building industry where clients were predominantly fit and healthy. The client base of personal trainers today includes untrained individuals often aspiring to lose weight and enhance their general health. For over a
decade, personal trainers have been identified as a potential workforce for public health promotion and chronic disease prevention \textsuperscript{21, 22, 63}. However, there has been limited research to support the development of the workforce to fulfil such roles.

The latest fitness industry report estimates 32,500 personal trainers are currently practising in Australia \textsuperscript{23, 69}, making this workforce five times larger than AEPs and four times larger than the APD workforce \textsuperscript{18, 19}. Similar to AEPs and APDs, the distribution of personal trainers is high in mid to high Socio-Economic Status (SES) regions, metropolitan and urban areas of Australia \textsuperscript{18, 19, 70}. Access is further supported by private health rebates towards fitness centre membership and personal trainers \textsuperscript{71}. Some private health insurance companies recognise the potential of personal trainers to complement traditional health care and provide up to $500 per annum towards of the cost of a gym membership and/or personal trainer as a rebate \textsuperscript{72}. Moreover, when prescribed by a medical professional there is room for negotiation on the cost covered by insurance towards a personal trainer \textsuperscript{71, 72}. Approximately 55\% of Australians have private health insurance (excluding Ambulance only policies) \textsuperscript{71}. Personal trainer sessions can range in price from $40-$90 per hour, with cheaper options available for small groups (3-6 people) \textsuperscript{72}. As such, a cost reduction for personal trainers may increase their accessibility and use for a considerable proportion of the Australian population. Therefore, the combination of exercise care and nutrition care from personal trainers has the potential to enhance individuals’ health and reduce their risk of chronic disease \textsuperscript{21, 70}.

\textbf{2.4.1 Educational preparation}

No qualifications are required to provide services as a personal trainer. However, a Certificate III in Fitness and Certificate IV in Fitness are the industry preferred minimum standards in Australia and internationally \textsuperscript{73}. These qualifications are set at level 3 and level 4 on the Australian Qualifications Framework (AQF) and may be gained either through in
person or online modes of study. Personal training courses typically range in length from 4 weeks to 6 months, but can extend for two years. Topics covered typically include planning and delivery of fitness sessions, first aid, principles of business, occupational health and safety as well as the national dietary guidelines. As such, the majority of personal trainers are post-secondary educated with basic knowledge of exercise programs, business, occupation specific safety issues and nutrition. Approximately 5% of the personal trainer workforce have completed a Diploma of Fitness (AQF level 5) or Bachelor degree (AQF level 7), both of which provide more in depth education in physiology, anatomy, metabolic processes and appropriate information sourcing. Personal trainers with a Diploma of Fitness or Bachelor degree may be more adept at critically appraising and applying information. Further detail on the variety of qualification pathways and outcomes for fitness professionals and personal trainers is provided at Appendix 1.

Personal trainers with a Certificate or Diploma of Fitness, or less, are not recognised as qualified health professionals. A health professional is classified by the World Health Organization as one who conducts diagnostic, curative, preventative and rehabilitative services requiring a level of skill equivalent to an AQF level 7 or above. Without recognition as a health professional, personal trainers do not receive government funding to provide services for individuals. However, as previously mentioned, some private health insurance companies recognise the potential positive impact of personal trainers on health and provide substantial rebates to enhance consumer access. As such, while personal trainers are not officially recognised as health professionals due to their level of education, they still receive some support from the healthcare industry for their role.
2.4.2 Professional certification

Voluntary registration for all fitness professionals, including personal trainers, is available with Fitness Australia or Physical Activity Australia. Both industry bodies require personal trainers to attain a Certificate III and Certificate IV in Fitness and require proof of ongoing professional development through the completion of short educational courses. The aim of these educational standards is to establish a minimum standard of client care. However, Fitness Australia is the only national industry body to have defined roles and responsibilities for all fitness professionals including group fitness instructors, gym instructors and personal trainers. Fitness Australia also maintains a larger member population than Physical Activity Australia, with 27,500 and 5,000 registered members respectively. Finally, Fitness Australia is the only national register recognised by the International Confederation of Exercise Professional Registers (ICREPs), which ensures the standards for registration are similar to that of other ICREPs recognised countries. As such, Fitness Australia will be the main regulatory body discussed in this thesis.

The ICREPs was established in 2012 to assist the development of industry standards between countries for fitness industry workers. The ICREPs recognise national registers for fitness professionals (such as Fitness Australia) and assist in the recognition of international qualifications and reciprocal practice for registered fitness professionals. For example, a personal trainer registered with Fitness Australia is eligible to also practice as a personal trainer in the UK.

ICREPs advocate for the development of national fitness professional registers and guide the implementation of standards. The establishment of national registers helps to impose minimum education standards for fitness professionals, which standardises the minimum competence level. In turn, standardisation improves the safety and reputation of fitness
industry workers. To be recognised by ICREPs, a national register must operate independently from training organisations and must provide role descriptions for registered exercise professionals. Note that while the registering bodies ICREPs and Fitness Australia refer to their members as Registered Exercise Professionals, the terms fitness professional and exercise professional are used interchangeably by industry bodies and throughout this thesis.

2.5 Regulation of Personal Trainers in Australia

The roles and responsibilities of personal trainers were first investigated in Australia over a decade ago. It was discovered that as an emerging profession, personal trainers often provided services outside their role description in order to attract and maintain clients. The research recommended that domains and boundaries of practice for exercise professionals be defined and align with their education level and competence to practice.

2.5.1 Australian personal trainer scope of practice

A scope of practice is a document developed by credentialing bodies that defines the permitted procedures, processes and actions for a registered practitioner. In 2014, Fitness Australia released a national scope of practice document for registered exercise professionals. Table 3 outlines what is within and beyond the scope of practice for Fitness Australia registered personal trainers.
Table 3: Professional scope and boundaries for personal trainers registered with Fitness Australia (Adapted from the Fitness Australia Position Statement: Scope of practice for Registered Exercise Professionals [29])

<table>
<thead>
<tr>
<th>A registered personal trainer has a scope of practice that includes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Pre-exercise health screening.</td>
</tr>
<tr>
<td>• Safety and risk assessment and management.</td>
</tr>
<tr>
<td>• Application of first aid to clients where required.</td>
</tr>
<tr>
<td>• Fitness assessment and analysis in accordance with knowledge and skill obtained through qualification and/or continuing education.</td>
</tr>
<tr>
<td>• Development of safe, effective and appropriate exercise programs tailored to client or group needs.</td>
</tr>
<tr>
<td>• Exercise delivery inclusive of demonstrating, instructing, monitoring, reviewing and modifying program content including technique, method and progression.</td>
</tr>
<tr>
<td>• Working within professional limitations to provide basic healthy eating information and advice through the application of nationally endorsed nutritional standards and guidelines.</td>
</tr>
<tr>
<td>• Provision of general nationally endorsed public health information that will educate and support positive client health outcomes.</td>
</tr>
<tr>
<td>• Use of evidence-based protocols to enhance client exercise adherence through goal setting, motivation, guidance, social support, relapse prevention and feedback.</td>
</tr>
<tr>
<td>• Compliance with the professional and ethical code of practice for terms across:</td>
</tr>
<tr>
<td>o Relationship with and responsibilities to clients</td>
</tr>
<tr>
<td>o Professional integrity</td>
</tr>
<tr>
<td>o Professional relationships and responsibilities</td>
</tr>
<tr>
<td>o Professional standards</td>
</tr>
<tr>
<td>• Compliance with legislation and regulation including:</td>
</tr>
<tr>
<td>o Jurisdictional OH&amp;S legislation</td>
</tr>
<tr>
<td>o Privacy Law</td>
</tr>
<tr>
<td>o Consumer Law</td>
</tr>
<tr>
<td>o Anti-discrimination Law</td>
</tr>
<tr>
<td>o Criminal Law</td>
</tr>
<tr>
<td>o Local government policy</td>
</tr>
<tr>
<td>o Setting specific policies or regulations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A registered personal trainer’s scope of practice does not include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provision of nutritional advice outside of basic healthy eating information and nationally endorsed nutritional standards and guidelines.</td>
</tr>
<tr>
<td>• Therapeutic treatment or independent rehabilitative exercise prescription.</td>
</tr>
<tr>
<td>• Independent exercise prescription for high risk clients.</td>
</tr>
<tr>
<td>• Diagnostic tests or procedures.</td>
</tr>
<tr>
<td>• Sports coaching.</td>
</tr>
<tr>
<td>• Psychological counselling.</td>
</tr>
</tbody>
</table>
The emphasis of this position statement is focused on the delivery of safe exercise programs such as a mandatory health risk screening at the first session. Providing nutrition care in line with national guidelines is supported, while nutrition care beyond the nationally endorsed guidelines is specifically listed as beyond the scope of any exercise professional. Referral of clients to medical or allied health professionals, when needed, is also listed as a responsibility for personal trainers. This means that personal trainers are supported by their industry body to provide nutrition care including translation and application of the national dietary guidelines. However, for individualised or more complex nutrition care, such as diet plans or nutrition information beyond the national dietary guidelines, personal trainers should refer clients to an appropriate health professional such as an Accredited Practising Dietitian.

Scope of practice documents are intended to define acceptable practices, yet there are several limitations to this scope of practice document which may lead to various interpretations. Firstly, the Fitness Australia scope of practice for registered exercise professionals does not include clear competency standards that outline required knowledge and skills to support an ability to perform the tasks of a personal trainer. Secondly, the document is listed as a business position statement rather than a legally binding code of practice. The first paragraph states that ‘…it is not the intention of this document to impede innovative practice, stifle opportunities or limit consumer access to services…’ Thirdly, there is no current information on the awareness or influence of this new scope of practice within the fitness industry. Previous research conducted over 15 years ago indicates a generally poor awareness of fitness industry codes and guidelines. The influence of the current scope of practice on personal trainer behaviours remains unknown. Understanding the interpretation and awareness of the scope of practice is useful to gauge how it influences current practices.

Beyond compliance, enforcement of the scope of practice presents further limitation. Enforcement of the Fitness Australia scope of practice for registered exercise professionals
occurs through reports to state consumer protection agencies, or Fitness Australia, depending on the nature of the complaint. The complaints process is complex due to differing codes of practice for fitness businesses between states and territories and the uncertainty as to whether a complaint should be directed to Fitness Australia or a consumer protection agency. Furthermore, the scope of practice document for fitness professionals is available on the Fitness Australia website, yet is not widely promoted to the public. This introduces the potential for underreporting of breaches to the scope of practice as consumers may not understand what is within and beyond the domains of practice for personal trainers. Consequences for breaching the scope of practice are limited to de-registration, yet a personal trainer is not required to be registered to practice. As such, personal trainers may provide services that extend beyond the areas in which they have demonstrated competence, such as provision of nutrition care beyond application of the national dietary guidelines. Providing nutrition care beyond demonstrated competence may negatively impact client health outcomes, warranting further investigation.

2.5.2 Risk management within the Australian fitness industry

Provision of nutrition care beyond translation of the national nutrition guidelines has been raised as a risk within the fitness industry. In response to industry risks, the Australian Fitness Industry Risk Management (AFIRM) project was established in 2014 by Fitness Australia and Sports Medicine Australia (funded by the Australian Research Council). The multiphase study aimed to identify fitness industry risks, the extent to which those risks are perceived as important, management techniques for identified risks within fitness businesses and current practices of fitness businesses.

Operating outside the scope of practice, particularly with regard to nutrition, was identified by industry workers as a serious concern due to the potential for misleading or inappropriate
advice that may harm clients. A questionnaire completed by 1178 fitness professionals in 2014 showed that 70% reported being asked about nutrition frequently. Furthermore, 90% of fitness professionals reported feeling competent to provide nutrition advice, despite not having clearly defined competency standards for nutrition. However, the extent to which this study accurately portrays competence to provide nutrition advice is questionable. Due to the multifaceted nature of nutrition care, actual competence is difficult to measure. For example, factors that influence dietary behaviour change in an individual may not be directly associated with nutrition care provided by a specific professional. As such, self-perceived competence in providing nutrition care is a more realistic measure to obtain and can provide a proxy measure of actual competence. However, to more accurately understand self-reported competence to provide nutrition care, more detail is required regarding self-reported competence for nutrition specific skills and knowledge.

Nutrition organisations and health professionals, both in Australia and internationally, maintain that personal trainers do not possess appropriate underpinning scientific knowledge to provide nutrition care beyond translation of the national dietary guidelines. Organisations with a vested interest in nutrition care, such as the Dietitians Association of Australia (DAA), have challenged the capacity for personal trainers to provide nutrition care: ‘...there is not a need for personal trainers to attempt to provide individualised dietary advice to their clients as this ‘demand’ can be met by qualified APDs and that individuals with less training put themselves and their clients at risk.’

Particular concern has been expressed over nutrition care tasks that personal trainers may undertake such as: individualised dietary assessment on shopping and dietary habits, the development of meal plans and provision of nutrition information for body composition goals. Despite being listed as a core responsibility in the Fitness Australia scope of practice,
nutrition organisations believe that the comparison of the recommendations from the national dietary guidelines to individual dietary intake and providing tailored dietary advice requires specific competencies achieved only through dietetics training. There are short courses available to personal trainers that claim to provide dietetics competencies, with recognition from Fitness Australia, but not from nutrition or dietetic organisations. Clearly, an understanding of the education underpinning the nutrition competence of personal trainers would provide insight into their capacity to provide safe and effective nutrition care.

2.5.3 Minimum nutrition education required for registered personal trainers

Registered personal trainers generally receive some education to assist them in the translation and application of national dietary guidelines to clients. Typically, a Certificate III and Certificate IV in Fitness include two training modules dedicated to nutrition. Appendix 1 provides a detailed description of the nutrition competencies which can be achieved by completing the available personal training qualifications. In Australia, the length, cost and intensity of personal training courses differ and the standard of examination for classes, such as nutrition, vary widely. This means that competence in nutrition care is likely to vary upon registration with Fitness Australia. Service Skills Australia updated the required courses and expected outcomes for fitness related courses in 2015/16. However, there is limited information on the actual nutrition content covered within personal training courses offered by registered training organisations. As such, an understanding of information sourcing practices may provide insight into the nutrition knowledge and understanding of personal trainers.

2.5.3.1 Information sourcing practices of personal trainers

Three studies have investigated the general information sourcing practices of personal trainers, one of which included sourcing of nutrition information. An American survey of
325 personal trainers found that textbooks and class notes were the most frequently reported sources of information. A qualitative study identified word-of-mouth and the internet as common sources of information among personal trainers from New Zealand. Interestingly, both of these studies found that personal trainers with higher education (tertiary qualifications) were more likely than personal trainers without this level of education to report scientific journals as a source of information. Furthermore, personal trainers with a tertiary education were less likely to report mass media and the internet as primary information sources. Personal trainers with the equivalent of a Certificate IV in Fitness or less reported difficulty in determining the accuracy and credibility of information sources. Qualitative interviews of 11 personal trainers in the UK revealed that informal learning (peer-to-peer) was perceived as more valuable and pertinent than formal education. As such, it appears that the varied sources of information appear to impact knowledge and understanding of personal trainers. In terms of nutrition, this is likely to influence personal trainers’ ability to provide evidence-based nutrition care and may influence their choice to take part in nutrition-related professional development.

2.5.3.2 Continued education for personal trainers in nutrition

Completion of professional development is required by Fitness Australia and is promoted within the scope of practice document as important in obtaining and maintaining currency of knowledge and skills. Personal trainers must accrue 20 Continued Education Credits (CECs) every two years to maintain registration. However, the area of professional development is at the discretion of the personal trainer.

Professional development is a process of improving and maintaining knowledge and skills required for professional functionality. Development of professional functionality involves institutional or regulatory recognition to enhance professional function and autonomy of the entire workforce and self-recognition to clarify professional objectives. Personal trainers in
the UK have reported that professional development courses are time consuming and expensive. While there are no similar reported findings from Australia, many personal trainers appear to choose the cheapest and quickest courses to maintain registration. Clearly, there are factors influencing participation in continued education that do not relate to development of confidence, professional function or autonomy.

Without clear competency standards for nutrition knowledge or skills, it is difficult to determine if CEC courses are appropriate for development of professional competence. For example, the scope of practice clearly states the boundary for nutrition care from personal trainers is providing information in line with the national dietary guidelines. However, nutrition CECs on the Fitness Australia website from 2015 state that graduates may assess, diagnose and provide individualised nutrition information and meal plans based on nutrition information beyond the national dietary guidelines (see Appendix 2). This suggests a lack of consistency from Fitness Australia with regard to its scope of practice. To further complicate matters, courses not openly endorsed by Fitness Australia, such as the FIA Fitnation Diploma of Nutrition and Dietetics also promote dietetics competencies for fitness professionals without meeting accredited standards. The DAA has voiced its concern, stating the nutrition courses for personal trainers do not provide enough education to support mastery of nutrition competencies that are required to make a nutrition diagnosis and to provide individualised dietary advice. In 2015, the DAA requested that such nutrition courses be discontinued, however at the time of submitting this thesis there are still nutrition courses available with similar claims endorsed by Fitness Australia (See Appendix 2). The impact and effectiveness of nutrition care from personal trainers remains poorly understood and warrants further investigation.
2.6 Personal trainers providing nutrition care

In the last 15 years, two North American surveys\(^{31, 32}\) and two Australian surveys\(^{30, 33}\) have investigated nutrition care from fitness professionals including personal trainers. Only one of the two Australian surveys has investigated which nutrition topics are usually discussed between personal trainers and clients and how nutrition information is provided\(^{30}\). All four surveys found that more than 80% of fitness professionals report providing nutrition care\(^{30-33}\). These studies indicate a high prevalence of nutrition care and high perceived confidence in providing nutrition care.

2.6.1 Behaviours relating to nutrition care

A survey of 129 personal trainers from the USA found that while most personal trainers reported feeling prepared to provide nutrition care, less than 50% passed a nutrition knowledge test\(^{31}\). Similarly, 90% of 1,178 Australian fitness professionals (not all personal trainers) reported feeling prepared to provide nutrition advice, with the majority confident in their nutrition knowledge\(^{33}\). A Canadian survey of 286 personal trainers found that lower reported levels of education related to more frequent incidences of nutrition analysis and counselling\(^{32}\). Furthermore, the Canadian personal trainers reported that although important, the national nutrition guidelines were not used with clients\(^{32}\). Although these studies indicate that nutrition care from personal trainers is highly prevalent, they did not directly investigate whether the nutrition care provided was beyond translation or application of the national nutrition guidelines, and none of these studies determined the awareness of a scope of practice or boundaries to professional practice.

A survey of 289 Australian fitness professionals (not all personal trainers) reported that 88% provided nutrition care beyond the national nutrition guidelines\(^{30}\). Of these, less than 25% had completed continuing education in nutrition. This is concerning, particularly in Australia,
as competence in nutrition care is not guaranteed due to the variability of fitness qualifications. Nutrition topics frequently discussed included eating for general health, weight management, nutrition for heart disease, sports nutrition, blood glucose control for diabetes, nutrition deficiencies, dietary supplements, food intolerances/allergies and eating disorders. The majority of the information was delivered verbally, with some written food diaries, fact sheets and meal plans. This study creates further concern that personal trainers are providing nutrition care beyond their scope of practice and without further nutrition education. However, the study did not determine if personal trainers were aware of the scope of practice, nor did it consider the environment in which nutrition care was provided.

2.6.2 Environmental factors relating to nutrition care

A unique relationship is formed between personal trainers and clients through training, where professional boundaries may occasionally become blurred. This can create challenges determining if nutrition care originates from a professional or personal context. Other factors such as the regulatory environment, the business environment, the physical environment and the educational environment may also influence the type and extent of information exchanged between personal trainers and clients. As such, investigation into the environment and context in which nutrition care is provided by personal trainers is warranted.

Of the four studies that have investigated nutrition care from personal trainers, all concluded that stricter regulation and enforcement is required for personal trainers in the area of nutrition care. No study considered strategies to harness the potential of personal trainers to provide basic nutrition care. This is likely due to a lack of information about the current environment in which personal trainers provide nutrition care. As such, further investigation into the ability of personal trainers to provide basic nutrition care is needed. This should include an exploration of industry norms, actual nutrition practices, potential barriers or
enablers for nutrition care and perceived effectiveness at facilitating improvements in the dietary behaviours of Australian adults.

2.7 Summary of literature

Personal trainers are well placed to help improve the dietary behaviours of many Australians. However, the scope of practice for personal trainers only includes nutrition care in line with national guidelines. Limited information exists regarding personal training practices in Australia, though it is clear that personal trainers provide nutrition information beyond the recommended scope of practice. Personal trainers may overestimate their nutrition competence, regardless of their level of education, and may place some clients at risk of detrimental outcomes. Providing nutrition care beyond the recommended scope of practice for fitness professionals has been highlighted by industry workers as a serious concern due to the potential for negative client health outcomes. Still, any nutrition care is likely better than none at all and there is clear potential for personal trainers to facilitate improvements in dietary behaviours of individuals, which may reduce their risk of chronic disease. Further investigation into the capacity of personal trainers to provide safe and effective nutrition care is warranted.

2.8 Problem identification and thesis aims

The problem identified in this Chapter was that personal trainers provide nutrition care beyond their scope of practice, which presents a risk to client health. This problem has been identified by workers within the fitness industry and by health professionals. To appropriately address the problem of personal trainers providing nutrition care beyond their recommended scope of practice, further exploration of behavioural and environmental influences on nutrition care in personal training is required. For example, it is currently unclear if personal trainers intentionally provide nutrition care beyond the recommended scope of practice or if
other environmental factors, such as client expectations and/or awareness and interpretation of policy, influence the provision of nutrition care.

The aim of this thesis was to explore nutrition care provided by Australian personal trainers and the factors that influence nutrition care being provided beyond the recommended scope of practice by registered personal trainers. Addressing this aim included an exploration of behavioural factors such as knowledge, attitudes and skills as well as environmental factors such as regulation, education, and social expectations. The objectives of this thesis were:

1. To investigate the intention of Australian fitness businesses to promote the provision of nutrition care by personal trainers.
2. To explore client expectations of nutrition care provided by personal trainers in Australia.
3. To measure the self-perceived competence of Australian personal trainers in providing nutrition care.
4. To explore the context in which personal trainers provide nutrition care by understanding personal trainers’ perceptions of nutrition care in relation to their role and scope of practice.
5. To compare nutrition components of national educational and occupational policies for personal trainers to ICREPs Global Standards.

Five original studies were designed and undertaken using a mixture of qualitative and quantitative methods. The following chapter outlines how the studies within this thesis were guided by a methodological framework. The results of this research will inform future strategies to influence the behaviours and/or environment for personal training that will in turn support personal trainers to provide safe and effective nutrition care, which will ultimately benefit clients.
Chapter 3
Research Framework

3.1 Preface

Stakeholders within the fitness industry have identified the provision of nutrition care beyond the recommended scope of practice as a preventable industry risk. Still, personal trainers have ample opportunity to provide nutrition care that may facilitate improvements in dietary behaviours and reduce the burden of chronic disease in Australia. Chapter 2 described the limited research that investigated personal trainers’ provision of nutrition care. To further explore and understand this area, a structured approach to research is needed so as to guide recommendations that may reduce the risks and maximise the benefits associated with personal trainers providing nutrition care.

This thesis was guided by the PRECEDE steps within the PRECEDE-PROCEED framework. The framework was considered appropriate as the PRECEDE steps are used specifically for problem analysis including consideration of the underlying determinants of behavioural and environmental change. This thesis also employed a programmatic approach to problem solving which allowed each study to inform and direct the next. The following chapter will initially discuss the development and use of the PRECEDE-PROCEED framework. Next, the PRECEDE steps will be used to outline the progression of research within this thesis. An overview of the original studies and thesis chapters will be provided for each step of the PRECEDE framework with a summary of the aims, methods and sequential findings.
### 3.2 PRECEDE-PROCEED framework

The PRECEDE framework was first developed in the 1970s as a linear problem diagnosis and analysis tool for health promotion intervention planning. The acronym stands for: Predisposing, Reinforcing and Enabling Constructs in Environmental/Educational Diagnosis and Evaluation. There are four steps within the PRECEDE part of the framework: (1) Define the desired outcome; (2) Identify the issue (behaviour, lifestyle, and/or environment); (3) Identify the factors which influence behaviour and lifestyles, or responses to environment (Predisposing, Reinforcing and Enabling factors); and (4) Identify best practice and other sources of guidance for interventions (administration, policy and/or regulation). The addition of the PROCEED steps occurred in 1991, and allowed for an evaluation phase to match and follow-on from planning phases. PROCEED stands for: Policy, Regulatory and Organisational Constructs in Educational/Environmental Diagnosis and Evaluation. There are four steps within the PROCEED phase: (1) Implementation of an intervention; (2) Process Evaluation (evaluation of Predisposing, Reinforcing or Enabling factors targeted); (3) Impact Evaluation (evaluation of behaviour, lifestyles or environmental factors targeted); and (4) Outcome Evaluation (re-evaluation of the desired outcome). The PROCEED component of the framework extended beyond the scope of this thesis, but provides clear guidance for future research. Figure 1, over the page, shows the framework as it moves in an anti-clockwise direction.
Further refinement of the framework in 2005 included validation of pathways which link the causal assessment of the problem to the intervention planning and evaluation phases as shown by the black arrows in Figure 1\textsuperscript{102}. Still, the framework does not predict or explain the relationships between individual factors of the problem. Instead, the model provides a structure to guide research and to assist the selection of a theoretical lens which may help understand how to impact change in behaviours or environment, which may in turn impact the problem and outcome\textsuperscript{101, 102}.

There were several reasons for selecting the PRECEDE-PROCEED framework to guide this thesis. Firstly, the PRECEDE-PROCEED framework is one of the few research frameworks that supports a thorough problem analysis. The PRECEDE-PROCEED framework supports
problem analysis through community engagement, whereby the community actively identifies the problem and assists in identifying avenues of change. Problem analysis is important when there is limited previous research, such as with personal trainers providing nutrition care. Secondly, extensive use and refinements to the framework have improved rigor, validity and ease of application of this framework for health promotion campaigns. Finally, the flexibility and scalability of the framework means that it can be applied across a variety of situations and settings, with both large and small populations. The flexibility of the framework allows it to be applied in situations where health is not an immediate desired outcome – such as curriculum development and continuing education programs. Furthermore, when there is limited previous research, flexibility extends to the researchers who must decide at each step of the framework if further refinement or diagnosis of the issue is required or if they will continue through the framework steps using assumptions based on evidence gathered. Application of theories can be helpful to support assumptions required to move through the framework and to assist in the development of possible interventions.

Theories of change can be selected once the level of change required to meet the desired outcome is determined. For this thesis, the theory of planned behaviour was chosen to support changes in individual or group behaviour based on the findings of the studies and has guided the recommendations section of this thesis.

3.3 Outline of thesis using the PRECEDE framework

The PRECEDE steps were selected for this thesis to guide the research projects and to support problem analysis prior to recommendations for intervention. As there is limited research in this area, a thorough understanding of the problem was required before recommendations could be made for future strategies or interventions. The expected time and
resources to select an appropriate intervention and complete the PROCEED cycle extended beyond the scope of this thesis. However, potential interventions will be presented in the discussion and conclusions section of this thesis (Chapter 9). Figure 2 illustrates how the PRECEDE steps have been addressed across the five studies and lists the corresponding chapters.

**Figure 2: Outline of thesis using the PRECEDE framework**

### Step 1 – Define the desired outcome
- Literature review (Chapter 2)

### Step 2 – Identify the issue
- Review of advertised nutrition services in personal training (Chapter 4; Study 1)

### Step 3 – Examine the factors that influence behaviour, lifestyles and responses to the environment
- Survey of public perceptions for nutrition care from personal trainers (Chapter 5; Study 2)
- Survey of personal trainers’ self-perceived competence to provide nutrition care (Chapter 6; Study 3)
- Interviews with personal trainers (Chapter 7; Study 4)

### Step 4 – Identify Best Practice and sources of guidance for intervention design
- Review of international standards for nutrition care in personal training (Chapter 8; Study 5)

3.3.1 Step 1 – Define the desired outcome

A literature review is presented in Chapter 2 which aimed to outline the problem and explore the potential for personal trainers to provide nutrition care. Both white and grey literature were included in the narrative review to provide an understanding of how personal trainers may play a role in providing nutrition care. Overall, the literature review established that stakeholders within and external to the fitness industry recognise that personal trainers have potential to act in health promotion and chronic disease prevention by providing both
individual nutrition and exercise care. Recently, industry bodies identified the provision of nutrition care beyond the national dietary guidelines as a significant industry risk. In addition, fitness industry stakeholders and health professionals have expressed concern that personal trainers extending beyond the scope of practice in terms of nutrition care may lead to misleading or inappropriate advice that may harm clients. As such, the desired outcome identified from this review was to support personal trainers to provide safe and effective nutrition care, in line with their professional scope of practice, which will ultimately benefit client health.

3.3.2 Step 2 – Identify the issue

The problem identified was fitness professionals providing nutrition care beyond the recommended scope of practice. What remained unclear was if personal trainers intentionally provided nutrition care beyond the recommended scope of practice, or if it arose naturally due to the ‘spill-over’ motivational effect observed in personal training (see Chapter 2, page 22). Two studies (see Chapter 4 and Chapter 7) were undertaken to explore the behavioural and environmental elements of personal trainers providing nutrition care beyond the recommended scope of practice.

A review of advertisements and nutrition content on Australian registered fitness business websites and social media sites was undertaken to explore behavioural elements (Chapter 4). The aim of this study was to investigate the intention of fitness businesses to promote personal trainers as able to provide nutrition care, and the extent of these services in relation to the scope of practice document. A review of advertised services may indicate intent of personal trainers to provide nutrition care beyond the recommended scope of practice.

In-depth interviews with 15 personal trainers in Australia were used to investigate environmental elements of personal trainers providing nutrition care beyond the
recommended scope of practice (Chapter 7). The primary aim of the interviews was to explore the current nutrition care practices, and the context in which nutrition care is being provided. Understanding the context in which nutrition care is provided may identify whether nutrition care arises from personal trainers initiating the conversation or from clients requesting nutrition information. Investigating practices may confirm if the nutrition care provided by personal trainers actually extends beyond the recommended scope of practice.

3.3.3 Step 3 – Examine the factors which influence behaviours and responses to the environment.

Three studies (see Chapters 5, 6 and 7) were undertaken to identify predisposing, reinforcing and enabling factors which influenced responses to the environment and behaviours of personal trainers. The three studies explored factors associated with (i) client expectations (ii) personal trainers’ beliefs about their role, and (iii) the environment in which personal training occurred.

An online survey of 627 Australian residents explored the enabling and reinforcing factors related to client expectations of personal trainers (see Chapter 5). The aim of this study was to explore expectations of personal trainers, with regard to nutrition care, from the perspective of clients and potential clients (collectively, the client-base). Understanding client expectations may help to better understand if clients influence nutrition care in the personal training context.

An online survey to measure personal trainers’ self-perceived nutrition competence was undertaken to identify predisposing and reinforcing factors that influence personal trainer behaviour (see Chapter 6). A validated tool measured confidence in nutrition knowledge, nutrition skills, communication and counselling techniques, and attitudes towards providing nutrition care among 142 personal trainers. Exploring personal trainers’ self-perceived
competence may highlight the likelihood of personal trainers providing nutrition care for clients and how to support personal trainers to provide safe and effective nutrition care.

Enabling factors were further explored through the in-depth interviews with 15 personal trainers in Australia (see Chapter 7). The secondary aim of the interviews was to explore opinions of regulation and guidelines for nutrition care by personal trainers. Understanding the awareness of current regulations and opinions of national nutrition guidelines may highlight whether personal trainers intentionally provide nutrition care beyond their recommended scope of practice.

3.3.4 Step 4 – Identify best practice and sources of guidance for recommendations

Policy and organisational regulation was explored through a review of best practice guidelines for personal trainers providing nutrition care (see Chapter 8). The aim of this review was to compare the nutrition components in formal educational and occupational requirements for personal trainers to the international level standards for registered fitness professionals. A review of international and national level standards may help to identify the level of competence in nutrition care that the fitness industry expects and how best to support personal trainers to provide safe and effective nutrition care.

The following five chapters describe the studies and discuss the findings of each study discretely. Chapter 9 provides an overview of all results in the context of the PRECEDE steps as outlined in this Chapter.
Chapter 4

Study 1 - Promotion of nutrition care by Australian fitness businesses: A website analysis

4.1 Abstract
4.2 Introduction
4.3 Methods
4.4 Results
4.5 Discussion

Reader’s Note: This chapter encompasses a co-authored paper. The bibliographic details of the co-authored paper, including all authors, are:


The candidate’s contribution to this publication involved:

- Study conception
- Study design
- Data collection
- Data analysis and categorisation of the data into a usable format
- Interpretation of the data
- Writing of the manuscript

(Signed): (Date): 12/06/2017

Katelyn Barnes

(Countersigned): (Date): 12/06/2017

Supervisor: Associate Professor Ben Desbrow

(Countersigned): (Date): 12/06/2017

Supervisor: Dr Lauren Ball
Promotion of nutrition care by Australian fitness businesses: A website analysis

4.1 Abstract

Objectives: To investigate the intention of fitness businesses to promote the provision of nutrition care by personal trainers.

Study Design: Cross-sectional evaluation of webpage content.

Methods: Fitness businesses within two Australian federal electorates were identified using the Fitness Australia list of registered fitness businesses. Inductive content analysis of these fitness business websites and associated social media sites was undertaken to compare website content to the Fitness Australia Position Statement outlining the Roles and Responsibilities of Registered Fitness Professionals. Fitness businesses were classified as ‘within scope of practice’ if they referred to national nutrition guidelines or dietetic services. ‘At risk of being beyond scope’ included websites which did not include enough information to definitively state within or beyond scope. Fitness businesses were classified as ‘definitely beyond scope of practice’ if they advertised nutrition care which clearly extended beyond translation of the national dietary guidelines.

Results: Of the businesses reviewed, 15% were within scope despite none referring to a dietitian; 34% were at risk of being beyond scope; and 51% were beyond scope as they advertised nutrition care such as personalised diets without indicating dietetic input.

Conclusions: A considerable portion of fitness businesses reviewed advertised their personal trainers as able to provide nutrition care outside the recommended scope of practice. Strategies that help fitness businesses and personal trainers to support clients to have healthy dietary behaviours without extending outside the scope of practice are warranted.


4.2 Introduction

Poor diet and sedentary lifestyles are prevalent, modifiable risk factors for obesity and chronic disease. To prevent chronic disease, many countries have developed national guidelines for dietary behaviours and physical activity. In Australia, the dietary guidelines are referred to as the *Australian Guide to Healthy Eating* (AGHE). However, literature has highlighted a gap between individuals’ knowledge of dietary guidelines and actual dietary behaviours. For example, the majority of Australians are aware of the national dietary guidelines, yet less than 7% reach the recommended intake of core food groups, such as vegetables. Clearly, further action is needed to support individuals to translate dietary guidelines into practice.

Personal trainers are well placed to promote healthy dietary behaviours for a number of reasons. Firstly, personal trainers have close contact with many people who may be motivated to change their lifestyle including their dietary behaviours. More than 3 million Australians were reported to use the services of a registered fitness professional, such as a personal trainer in 2011, and almost 50% of Australians report that personal trainers are an appropriate source of nutrition information. Secondly, the relationship between personal trainers and their clients is unique. Clients usually interact with the same personal trainer on a regular basis and place high regard on advice provided. Moreover, clients request nutrition care from their personal trainers. Finally, fitness professionals have previously demonstrated confidence and capability to provide nutrition care by facilitating healthy dietary behaviours in patients with obesity and diabetes.

Fitness Australia is the first Australian fitness industry body to release a position statement outlining the scope of practice for fitness professionals. The scope of practice identifies specific qualifications, roles, responsibilities and boundaries for each category of fitness
There are four categories of fitness professionals: group fitness instructors, gym instructors, group exercise leaders, and personal trainers. To be registered as a personal trainer in Australia, a Certificate III and Certificate IV in Fitness are required. This is delivered as 30 units of study over 6 months \(^\text{116, 117}\). The International Confederation of Registers for Fitness Professionals recognises these defined roles and allows Fitness Australia registered fitness professionals and registered fitness businesses reciprocal practice in Europe, New Zealand, the United Kingdom, the United States of America, the United Arab Emirates and South Africa \(^\text{29}\). An Australian Business Number and address must be provided to register a fitness business. Currently, registration with Fitness Australia is voluntary. Still, it is quickly becoming a preferred industry standard with approximately 26,000 registered fitness professionals (1 fitness professional per 1000 Australians), and 1,290 registered fitness businesses \(^\text{111}\). Fitness business registration lasts 1 year and registration for fitness professionals lasts 2 years. Fitness professionals must complete 20 points of professional development per registration cycle \(^\text{111}\).

The Fitness Australia scope of practice document supports basic nutrition care being provided by personal trainers in accordance with national dietary guidelines \(^\text{29}\). Nutrition care involves a wide range of nutrition interactions and can include aspects of dietary assessment, advice and evaluation \(^\text{11}\). The scope of practice specifically states that personal trainers can provide ‘\textit{basic healthy eating advice through application of nationally endorsed nutrition guidelines}’ \(^\text{29}\). Fitness professionals agree to abide by this scope of practice when they register (or re-register); fitness businesses also agree to uphold this scope of practice for employees. However, concerns about the provision of nutrition care outside the national dietary guidelines have been raised within and external to the fitness industry. This is due to the potential negative outcomes of prescribing inappropriate diets \(^\text{33, 35}\).
Two recent studies have investigated the provision of nutrition care from personal trainers. A survey of 129 North American personal trainers showed more than 75% provided nutrition care to clients. However, less than 50% of these personal trainers passed a nutrition knowledge test based on the American nutrition guidelines. In Australia, 88% of 289 personal trainers surveyed reported providing nutrition care to clients. This included nutrition topics such as heart disease, diabetes/blood sugar, supplements and food allergies/intolerance, indicating the provision of care that is beyond the recommended scope of practice for personal trainers. Notably, the intent of personal trainers to provide nutrition care was not investigated, and it is therefore unclear whether personal trainers intend to extend outside their supported scope of practice, or if nutrition care is a subsidiary of promoting lifestyle change. Clarifying the intent of personal trainers to provide nutrition care is important in order to inform strategies that support safe, basic nutrition care within the scope of practice for individuals in this setting. Therefore, the aim of this study was to explore the nutrition-related content of registered fitness business websites to identify if the advertised services are within or outside the scope of practice for fitness professionals.

Fitness business nutrition-related website content and advertisements were considered for two reasons. First, nutrition content may create a public perception regarding the role and services a personal trainer should and are qualified to provide, including nutrition care outside of the personal trainer scope of practice. Second, the advertisement indicates that provision of nutrition care is likely to be an intentional service expected to be provided by employees of that business.

4.3 Methods

Convenience sampling was used to identify fitness businesses registered with Fitness Australia within two Australian Federal Electorates for website analysis. The two urban electorates were chosen due to the local emphasis on health and fitness, which was thought to
provide a rich and diverse sample. Businesses other than fitness services (e.g. equipment sales or passive relaxation/therapeutic service providers) were excluded. Franchise businesses were treated as one commercial entity. Businesses were excluded if a relevant website or social media account (Facebook or Twitter) was not found following an initial search via a generic search engine (Google). Institutional Review Board approval was not required for this study. Figure 1 illustrates the selection and exclusion process.

![Figure 1: The selection and exclusion process of registered fitness businesses within two Australian Federal Electorates](image)

Once identified, websites and social media accounts were searched by one investigator (KB) for key terms including “nutrition”, “diet”, “food”, “recipe” and “supplements”. Nutrition-related content of all websites and social media accounts was reviewed and nutrition-related quotes were recorded in a table for each fitness business. Up to 12 months of social media account activity was included. After all business websites and social media accounts were appraised, inductive content analysis was used to categorise nutrition-related content. Categories that emerged were: diet plans, food or nutrition claims, nutrition counselling and recipes. Businesses were classified as: “Within scope” if content referred to national nutrition guidelines or identified dietetic services; “At risk of being beyond scope” if content did not include enough information to definitively state within or beyond scope, such as ambiguous
content that may or may not have been based on the national nutrition guidelines; or “Beyond scope” if content was clearly beyond translation of the national dietary guidelines, such as nutrition information based on opinion or anecdotal evidence. A quality check was conducted by a second investigator (LB) who reviewed 10 of the business websites and social media accounts to ensure consistency and agreement of categories.

4.4 Results

Overall, 36 fitness businesses were included in this review. Single site fitness businesses or sole traders comprised 58% (n=21) of fitness businesses reviewed. The remaining multi-site businesses ranged in number of sites from 3 to 440 sites across Australia and employed a range of 2-20 personal trainers. Large franchise gyms (i.e. 50 or more sites across Australia) comprised 22% (n=8) of the sample. This included at least 1 franchise gym with over 2.5 million members across Australia. No fitness businesses in this study limited their services to a specific population (females, elderly, etc). An estimated total of 115 personal trainers were employed across all 36 sites, representing 0.55% of the estimated number of Fitness Australia registered personal trainers. None of the fitness businesses sampled advertised their personal trainers as qualified nutrition professionals (Registered Nutritionist or Accredited Practising Dietitian).

Of the websites reviewed, 14% (n=5) displayed content that was within the scope of practice, 34% (n=12) were at risk of extending beyond the scope of practice, and 52% (n=19) clearly breached the scope of practice for registered fitness professionals. Table 1 displays each identified category, as well as examples of content classified as within scope, at risk, and beyond scope. These included advertisements for diet planning, food or nutrition claims, nutrition counselling or recipe provision.
Table 4: Categories identified from reviewed business and examples of content classified as within scope, at risk, and beyond scope.

<table>
<thead>
<tr>
<th>Theme</th>
<th>n (%)</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diet Plans</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Scope</td>
<td>27 (75)</td>
<td>“…diet plans through our on-site Dietitian”</td>
</tr>
<tr>
<td>At Risk</td>
<td>1 (3)</td>
<td>“…we can provide a diet plan to help maximise your nutrition.”</td>
</tr>
<tr>
<td>Beyond Scope</td>
<td>15 (41)</td>
<td>“…your trainer will design you an individual Nutrition Plan. Your individually tailored plan will be based on your goals, fat free mass, activity level and, body type. You need to understand your daily macronutrients (carbohydrates, protein, and fats) and develop the right nutrition plan for long-term weight loss…”</td>
</tr>
<tr>
<td><strong>Food or Nutrition Claims</strong></td>
<td>17 (47)</td>
<td></td>
</tr>
<tr>
<td>Within Scope</td>
<td>2 (5)</td>
<td>“…1 cup of cooked peas contains 9g of protein…”</td>
</tr>
<tr>
<td>At Risk</td>
<td>4 (11)</td>
<td>“…we know that high protein diets can be beneficial for weight loss…but just how much protein do you need exactly?” link out to an unreliable source.</td>
</tr>
<tr>
<td>Beyond Scope</td>
<td>10 (27)</td>
<td>“…Health Benefits of Quinoa….treats diabetes, prevents cancer, lowers blood pressure…”</td>
</tr>
<tr>
<td><strong>Nutrition Counselling</strong></td>
<td>13 (36)</td>
<td></td>
</tr>
<tr>
<td>Within Scope</td>
<td>3 (8)</td>
<td>“Nutrition counselling services are available at xxx [local Dietitian]…”</td>
</tr>
<tr>
<td>At Risk</td>
<td>6 (16)</td>
<td>“…Your trainer will look at what, when, and why you eat certain foods to give you easy to implement strategies to drop the weight…”</td>
</tr>
<tr>
<td>Beyond Scope</td>
<td>5 (14)</td>
<td>“For fat loss…males work your protein intake on 2.5-3g of protein per kg of body weight taking into account current body fat. Female between 1.2 and 2 g per kg of body weight. Fat should be calculated 0.8 to 1.2g per kg of body for males and 0.5 to 0.8 for females depending on current body fat %. Depending on current body fat the rest of your intake for macros should be made up of large amount of green vegetables and fibre intake and fish oil. This will reduce inflammation and keep the body alkaline…”</td>
</tr>
<tr>
<td><strong>Recipes</strong></td>
<td>8 (22)</td>
<td></td>
</tr>
<tr>
<td>Within Scope</td>
<td>3 (8)</td>
<td>“Try this delicious recipe for dinner!” link to Quinoa and Spinach Pilaf with Lamb from taste.com</td>
</tr>
<tr>
<td>At Risk</td>
<td>1 (3)</td>
<td>“12-Week Challenge…we’ll provide you with recipes, meal plans and advice.”</td>
</tr>
<tr>
<td>Beyond Scope</td>
<td>4 (11)</td>
<td>“If you did the crime yesterday, you need to do the time today! Up and at it with an accelerator day omelette…only 3 grams carbohydrate and 31g protein!”</td>
</tr>
</tbody>
</table>
4.5 Discussion

This paper reviewed fitness business websites to determine if nutrition content and advertised nutrition services aligned with the scope of practice for registered fitness professionals. Most of the registered fitness businesses advertised services at risk of being, or clearly beyond, the scope of practice for registered fitness professionals as defined by Fitness Australia. By advertising these services it is evident that many fitness businesses promote their personal trainers as able to provide nutrition care or to encourage nutrition interactions outside the basic translation of the national dietary guidelines. This is important as personal trainers receive minimal nutrition education, which may not be adequate to support safe and effective nutrition care for clients.

Provision of nutrition care beyond the Fitness Australia scope of practice may occur for a number of reasons. Firstly, fitness businesses and personal trainers may not consider the nutrition care they provide to be outside the scope of practice. The ambiguity of ‘basic nutrition advice’ within the scope of practice document may have resulted in a variety of interpretations. The position statement encourages further education to expand the scope of practice of fitness professional. Specifically, the document states “...it is intended that this scope of practice for registered [fitness] professionals does not impede innovative practice, stifle opportunities for adaptation to a changing environment or limit consumer access to participate in services.” As such, there is freedom to interpret and apply the position statement in a variety of ways. Secondly, fitness businesses and personal trainers may not feel obliged to limit nutrition care to what is specified in the Fitness Australia scope of practice document. The document is a Fitness Australia position statement rather than a mandatory, or legally binding, scope of practice. It is possible that self-perceived competence in nutrition knowledge and positive attitudes towards the provision of nutrition care may outweigh the
motivation to abide by the scope of practice document. Alternatively, fitness professionals may not be aware of the scope of practice document, nor the risks associated with providing nutrition care. This indicates the need for stronger industry support and greater advertisement of the Fitness Australia scope of practice document. Although the sample from this study was small, and from a geographically defined location, it should be noted that 40% of the businesses included were multisite businesses, and 22% are widely accessible across Australia. For example this study reviewed 8 large franchise gyms which, due to the number of locations across Australia, contribute to approximately two thirds of the total number of registered fitness businesses in Australia. It is likely that the advertising from franchise gyms for nutrition care is similar, regardless of location. Though it should be noted that 85% of registered fitness businesses are located in urban areas, and rural fitness businesses may differ.

A recent survey confirms that nutrition care from fitness professionals extends beyond advertised services identified in this study to include topics of medical nutrition therapy. The Australian national curriculum for registered fitness professionals includes one nutrition competency unit covering content in approximately 12 hours. A limited understanding of diet-disease relationships could result in negative health outcomes for clients of fitness professionals. Negligence lawsuits from the USA emphasise the possible negative consequences associated with the inappropriate prescription of overly restrictive diets or calculated nutrient profiles without consideration of existing health problems. Other negative outcomes could be associated with the financial loss of paying for nutrition products or services with little to no positive health effects. It should be recognised that most clients who attend sessions with fitness professionals want to change their lifestyle to become

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2 The curriculum for Certificate III and Certificate IV in Fitness have been updated since publication of this article, and education of personal trainers now involves 2 courses in nutrition.
Therefore, fitness professionals, such as personal trainers, could be more supported to provide high quality nutrition care to clients in line with the Australian Guide to Healthy Eating.

There is conflicting information about the most effective method and context in which to provide nutrition care. While nutrition care from doctors and allied health professionals (such as dietitians and registered nutritionists) is held in high regard, there are several barriers which limit the access of these health professionals to provide effective nutrition care. For example doctors report having insufficient time and education regarding nutrition. Moreover, dietitians are a small workforce in comparison to fitness professionals and may be less accessible than personal trainers. There is clear potential for personal trainers to provide nutrition care, considering the high frequency in which they report to already providing this service, coupled with their demonstrated effectiveness to facilitate healthy behaviours, and the sizeable number of people who already consider personal trainers as an appropriate source of nutrition care. It is important to acknowledge that fitness services, such as a personal trainer, are likely to be utilised by individuals who are able to pay for the service. However, some of the fitness businesses reviewed in the current study provide nutrition care or advice through webpages or social media accounts, which may have an impact on individual dietary behaviours. Online avenues are likely to be accessible to a wider range of population groups and therefore strategies are warranted to ensure safe, evidence-based nutrition care is always provided.

A recent survey has shown that personal trainers feel confident in their ability to provide nutrition care. However, the limited formal nutrition education required to become a personal trainer may create inconsistencies in the quality of nutrition care provided, thus limiting the effectiveness of promoting healthy dietary behaviours at a population level.
The authors recognise advertised services investigated in this study may not necessarily align with actual practice. However, previous studies support the notion that Australian personal trainers provide nutrition care beyond the scope of practice\textsuperscript{30, 31}. As such, nutrition education that increases personal trainers’ awareness of their scope of practice may be helpful. Furthermore, a screening tool to assist personal trainers to identify when a client should be referred to an APD, registered nutritionist or accredited sports dietitian may be warranted.

This study explored the intention to provide nutrition care within the Australian personal training industry and clearly showed that fitness businesses encourage nutrition care from personal trainers. The fitness industry is clearly a potential setting for the provision of nutrition care. As such, nutrition education programs aimed at fitness professionals should focus on delivery of nutrition care within scope and establishment of referral pathways to dietitians. Finally, enforcement of the Fitness Australia scope of practice should be strictly implemented with repercussions for both fitness businesses and personal trainers for extending beyond their scope of practice.
Chapter 5

Study 2 - Australian personal trainers providing nutrition care:

Client expectations

4.1 Abstract
4.2 Introduction
4.3 Methods
4.4 Results
4.5 Discussion

Reader’s Note: This chapter includes a co-authored paper. The bibliographic details of the co-authored paper, including all authors, are:


The candidate’s contribution to this publication involved:

- Study conception
- Study design
- Data analysis and categorisation of the data into a usable format
- Interpretation of the data
- Writing of the manuscript

(Signed): (Date): 12/06/2017
Katelyn Barnes

(Countersigned): (Date): 12/06/2017
Supervisor: Associate Professor Ben Desbrow

(Countersigned): (Date): 12/06/2017
Supervisor: Dr Lauren Ball
Australian personal trainers providing nutrition care: Client expectations

5.1 Abstract

Objective: To explore client expectations of nutrition care provided by personal trainers in Australia.

Study Design: Cross-sectional online survey.

Methods: A survey explored the expectations for nutrition care provided by personal trainers among 627 Australian residents with an interest in fitness (including clients and potential clients of personal trainers). The survey used Likert-scales to explore expectations for nutrition care by, and nutrition knowledge of, personal trainers. Likert-scales were also used to explore the experiences of those who had received nutrition care among participants who had previously engaged a personal trainer. Participants’ demographic characteristics were also collected. Descriptive statistics were used to evaluate expectations. Pearson chi square was used to explore associations between expectations and participants’ demographic characteristics.

Results: Participants expected personal trainers to discuss and be knowledgeable about general healthy eating (92%; n= 577), muscle gain (92%; n=577) and weight loss (89%; n=559). Half of participants expected personal trainers to discuss and be knowledgeable about nutrition for chronic disease. Of the 334 participants who had previously engaged a personal trainer, most reported receiving nutrition care less frequently than they reported expecting nutrition care. Half of that group (n=167) reported that they were satisfied with the
nutrition care they received and 40% (n=132) reported positive dietary changes as a result of nutrition care from a personal trainer.

**Conclusion:** Personal training clients in Australia expect their personal trainer to provide nutrition care, sometimes beyond the recommended scope of practice. Strategies to manage client expectations are needed to assist personal trainers in providing safe and effective nutrition care.

**5.2 Introduction**

Diet and physical activity are pervasive modifiable risk factors for chronic disease \(^2\). The prevalence of poor dietary behaviours and physical inactivity is considerable in many countries. For example, the majority of adults in the USA, UK and Australia do not meet the recommended intake of fruits and vegetables and less than half achieve recommended levels of physical activity \(^4\text{–}9\), \(^51\). To help prevent and manage chronic disease, the World Health Organization recommends upskilling of health professionals and coordination between industries to facilitate improvements in dietary behaviours and physical activity of individuals and communities \(^3\), \(^118\).

Fitness professionals, such as personal trainers, are a large workforce actively engaged in the promotion of physical activity and health \(^23\), \(^69\). Personal trainers are ideally placed to act as advocates for healthy eating because individuals who employ a personal trainer are likely to seek advice concerning other health behaviours such as diet \(^21\), \(^24\), \(^25\). International standards for personal training encourage personal trainers to provide nutrition care in line with national dietary guidelines \(^28\). Similarly in Australia, the regulatory body for fitness professionals, Fitness Australia, has developed a scope of practice that endorses personal
trainers to provide nutrition care in line with national dietary guidelines. Such nutrition care may play an important role in the prevention of chronic diseases.

The provision of nutrition care beyond the recommended scope of practice has been identified as a major risk for the fitness industry due to the potential for inappropriate or misleading advice which may lead to poor health outcomes for clients. Personal trainers have been reported to provide nutrition care to clients beyond their recommended scope of practice including nutrition advice for managing chronic conditions (e.g. cardiovascular disease and/or diabetes), nutritional deficiencies, food intolerances and allergies. Personal trainers are often advertised as able to provide nutrition care beyond their recommended scope of practice (Chapter 4). Moreover, personal trainers have reported feeling confident and prepared to provide such specialised nutrition care to their clients despite having limited education in nutrition (Chapter 6). However, it remains unclear if the provision of nutrition care beyond the recommended scope of practice is initiated by the personal trainer or if it arises as a consequence of client expectations for specific dietary advice. The expectations on personal trainers from the perspective of clients (and potential clients) regarding nutrition have not previously been investigated.

Exploring expectations regarding nutrition care provided by personal trainers is important to help clarify the level of nutrition care that clients prefer from personal training services. This information can inform personal trainer education and/or occupational standards and may help to direct public health messages about seeking nutrition information for improved dietary behaviours. Therefore, this study aims to explore client expectations of nutrition care provided by personal trainers in Australia.
5.3 Methods

A cross-sectional online survey was conducted to describe the expectations of Australian personal trainer clients regarding personal trainers providing nutrition care. The study was approved by the Griffith University Human Research Ethics Committee (Ref No: 2016/045HREC).

5.3.1 Participants and Recruitment

Potential participants were clients and potential clients of personal trainers (all referred to as ‘clients’). This included Australian residents with an interest in fitness regardless of previous engagement of a personal trainer. Purposive and snowball sampling were used to recruit participants. Purposive sampling involved emailing the study details to personal trainers within the professional networks of the research team and requesting that they share the survey with their clients as well as surveying members of two large local gyms. Snowball sampling involved advertising the survey via the research team members’ personal and professional Facebook and Twitter accounts. The survey details and link were also advertised via mass email through a tertiary education provider to all students and staff.

5.3.2 Instruments

The survey was developed and administered using LimeSurvey™ version 1.9x. A survey was formulated after a review of literature on nutrition care, nutrition services and nutrition skills provided by personal trainers. Questions were tailored based on participant answers to ensure only relevant questions were asked. Table 5 outlines the survey tool including survey sections, rationale, area of enquiry and response format.
Table 5: Summary of survey tool including survey section, rationale and area of enquiry

<table>
<thead>
<tr>
<th>Section</th>
<th>Rationale</th>
<th>Area of Enquiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-reported health and use of personal training services.</td>
<td>To tailor the survey for each respondent, capture body mass index (BMI) and perceived healthfulness of diet.</td>
<td>Height and weight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perceived healthfulness of diet (5-point Likert scale)</td>
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<tr>
<td></td>
<td></td>
<td>Previous interactions with a personal trainer (MCQ)</td>
</tr>
<tr>
<td>Previous interactions with personal trainers and nutrition care. (Completed only by participants who had previously, or currently, engaged a personal trainer)</td>
<td>To explore the nutrition care participants have received from personal trainers.</td>
<td>Types of nutrition services provided (MCQ)</td>
</tr>
<tr>
<td></td>
<td>To determine if nutrition care received from a personal trainer has influenced dietary behaviours.</td>
<td>Satisfaction and usefulness of nutrition care (5-point Likert scale)</td>
</tr>
<tr>
<td></td>
<td>To explore the utility of nutrition care from personal trainers.</td>
<td>Influence on dietary behaviours and attitude towards food (4-point Likert scale)</td>
</tr>
<tr>
<td>Participant expectations of personal trainers providing nutrition care. Expected knowledge and skills of personal trainers to provide nutrition care.</td>
<td>To explore what participants expect from personal trainers with regard to nutrition advice, the level of nutrition knowledge and skills personal trainers should have.</td>
<td>Agreement with personal trainers providing nutrition care (5-point Likert scale)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agreement with nutrition care topics that personal trainers should discuss (5-point Likert scale)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Expected level of knowledge and skill personal trainers should have in nutrition care topics (5-point Likert scale)</td>
</tr>
<tr>
<td>Demographics</td>
<td>Demographic characteristics of sample.</td>
<td>Location (State)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gender</td>
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<tr>
<td></td>
<td></td>
<td>Level of education</td>
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</tbody>
</table>

The survey was piloted with seven individuals (four had engaged a personal trainer) for feedback on the appropriateness and interpretation of questions. Prior to data collection, minor wording changes were made in accordance with feedback. The finalised online survey
contained 35 items, required approximately 10 minutes to complete and was only available in English.

5.3.3 Data analysis

Descriptive statistics were calculated using frequency distributions for all items. Mean and standard deviation were calculated for continuous numerical items. The representativeness of the sample was investigated by comparing the demographic characteristics and self-reported health of survey participants to census data using chi-squared goodness of fit analysis. Pearson chi-squared tests were conducted to detect differences in responses based on gender, age (<30 years or >30 years), education level (current or previous attendance at university vs no attendance at university), self-reported healthfulness of diet (unhealthy & neither healthy or unhealthy diet vs healthy diet) and previous engagement of a personal trainer (currently or previously engaged a personal trainer (client) vs never engaged a personal trainer (non-client)). Pearson chi-squared tests were also used to explore the relationship between participants’ expectation of nutrition care and reported experience of receiving nutrition care from a personal trainer. Statistical significance was set at p<0.01 to reduce the likelihood of false positive errors. Data analysis was conducted using SPSS statistics version 20.

5.4 Results

In total, 756 individuals opened the online survey. There were 129 (17%) incomplete or ineligible responses, resulting in 627 responses. Table 6 outlines the demographic characteristics of participants, self-reported health and previous use of personal training services. The mean age (±SD) of participants was 29.8±11.2 years (range 16-74 years) with n=483 (77%) female respondents. Participants were categorised into clients (n=334, 53%) and non-clients (n=293, 47%). The majority of participants (n=365, 58%) reported to have a
healthy weight (BMI 18.5-24.9 kg/m$^2$) and most (n=386, 62%) perceived their diet as ‘healthy’.

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical Location</td>
<td></td>
</tr>
<tr>
<td>QLD</td>
<td>565 (90.1)</td>
</tr>
<tr>
<td>Other States and Territories</td>
<td>62 (9.9)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&lt;30 years</td>
<td>385 (61.4)</td>
</tr>
<tr>
<td>&gt;30 years</td>
<td>242 (38.6)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>144 (23.0)</td>
</tr>
<tr>
<td>Female</td>
<td>483 (77.0)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Australian</td>
<td>431 (68.7)</td>
</tr>
<tr>
<td>Other</td>
<td>196 (31.3)</td>
</tr>
<tr>
<td>Level of education currently completing or previously completed</td>
<td></td>
</tr>
<tr>
<td>Not university level (High school certificate or diploma)</td>
<td>133 (21.1)</td>
</tr>
<tr>
<td>University level (Bachelor or postgraduate degree)</td>
<td>494 (78.9)</td>
</tr>
</tbody>
</table>

Relative to national demographic data, there was an over representation of females ($\chi^2=183.287.125; p<0.001$), university educated individuals ($\chi^2=550.79; p<0.001$) and those within the healthy weight range ($\chi^2=187.21; p<0.001$) in the survey sample.  

**Table 6: Summary table of demographic characteristics of participants, self-reported body mass index (BMI), healthfulness of diet and use of personal training services (n=627)**

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographical Location</td>
<td></td>
</tr>
<tr>
<td>QLD</td>
<td>565 (90.1)</td>
</tr>
<tr>
<td>Other States and Territories</td>
<td>62 (9.9)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&lt;30 years</td>
<td>385 (61.4)</td>
</tr>
<tr>
<td>&gt;30 years</td>
<td>242 (38.6)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>144 (23.0)</td>
</tr>
<tr>
<td>Female</td>
<td>483 (77.0)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
</tr>
<tr>
<td>Australian</td>
<td>431 (68.7)</td>
</tr>
<tr>
<td>Other</td>
<td>196 (31.3)</td>
</tr>
<tr>
<td>Level of education currently completing or previously completed</td>
<td></td>
</tr>
<tr>
<td>Not university level (High school certificate or diploma)</td>
<td>133 (21.1)</td>
</tr>
<tr>
<td>University level (Bachelor or postgraduate degree)</td>
<td>494 (78.9)</td>
</tr>
</tbody>
</table>

**Self-reported Health and Personal Training Characteristics**

<table>
<thead>
<tr>
<th>Body Mass Index (BMI) (kg/m$^2$)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;18.5</td>
<td>33 (5.3)</td>
</tr>
<tr>
<td>18.5 - 24.9</td>
<td>365 (58.2)</td>
</tr>
<tr>
<td>25 – 29.9</td>
<td>145 (23.1)</td>
</tr>
<tr>
<td>30+</td>
<td>84 (13.4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perceived Healthfulness of Diet</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>386 (61.6)</td>
</tr>
<tr>
<td>Neither Healthy or Unhealthy</td>
<td>111 (17.7)</td>
</tr>
<tr>
<td>Not Healthy</td>
<td>130 (20.7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Personal Training Services</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Previously engaged a personal trainer (client)</td>
<td>334 (53.3)</td>
</tr>
<tr>
<td>Never engaged a personal trainer (non-client)</td>
<td>293 (46.7)</td>
</tr>
</tbody>
</table>
Table 7 outlines topics that participants expect personal trainers to discuss with clients as well as topics that participants expect personal trainers to be knowledgeable about. The majority of participants (n=497, 79%) indicated that personal trainers should provide nutrition care. However, participants reported variable views regarding which nutrition topics personal trainers should discuss. Most participants agreed that personal trainers should discuss and be knowledgeable about general healthy eating (n=554, 88%; n=577; 92% respectively), nutrition for muscle building (n=507, 80.9%; n=577; 92% respectively) and nutrition for weight loss (n=479, 76%; n= 559; 89% respectively). Fewer participants reported that personal trainers should discuss nutrition in relation to management of chronic conditions (n=292; 47%), deficiencies/eating disorders (n=228; 36%) and food intolerances and allergies (n=215; 34%). However, many participants expected personal trainers to be knowledgeable about nutrition for management of chronic conditions (n=344; 55%), deficiencies/eating disorders (n=302; 48%) and food intolerances and allergies (n=273; 44%).

Table 7: Client expectations and receipt of nutrition care from personal trainers

<table>
<thead>
<tr>
<th>Nutrition Topic</th>
<th>Expectation of nutrition knowledge n=627 (%)</th>
<th>Expectation of nutrition topics discussed n=627 (%)</th>
<th>Reported receipt of nutrition care topics n=334 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any nutrition care</td>
<td>N/A</td>
<td>497 (79.2)</td>
<td>N/A</td>
</tr>
<tr>
<td>General healthy eating</td>
<td>577 (92.0)</td>
<td>554 (88.4)</td>
<td>253 (75.7)</td>
</tr>
<tr>
<td>Muscle building</td>
<td>577 (92.0)</td>
<td>507 (80.9)</td>
<td>212 (63.5)</td>
</tr>
<tr>
<td>Weight loss</td>
<td>559 (89.2)</td>
<td>479 (76.4)</td>
<td>222 (66.7)</td>
</tr>
<tr>
<td>Sport specific nutrition</td>
<td>534 (85.2)</td>
<td>464 (74.0)</td>
<td>235 (66.5)</td>
</tr>
<tr>
<td>Performance supplements (e.g. protein powders)</td>
<td>488 (77.8)</td>
<td>386 (61.6)</td>
<td>182 (54.4)</td>
</tr>
<tr>
<td>Vitamin and mineral requirements</td>
<td>439 (70.0)</td>
<td>392 (62.5)</td>
<td>131 (39.2)</td>
</tr>
<tr>
<td>Management of</td>
<td>344 (54.9)</td>
<td>292 (46.6)</td>
<td>44 (13.2)</td>
</tr>
</tbody>
</table>
No differences were found between participants who had, or had not, engaged a personal trainer with regard to expectations of nutrition topics to be discussed or expected nutrition knowledge (p>0.01). However, significant associations were found between some demographic variables and participants’ expectations. Participants who had attended university reported significantly reduced expectations of nutrition care from personal trainers compared to participants who had not attended university with regard to management of chronic disease (54% vs 78%; χ²=15.32, p<0.001), deficiencies or eating disorders (43% vs 74%; χ²=24.63, p<0.001) and vitamin and mineral requirements (70% vs 89%; χ²=14.58, p<0.001). Participants who reported some attendance at university also reported significantly reduced expectations of personal trainer nutrition knowledge compared to participants who had not attended university. Specifically, university attendance reduced expectations for personal trainer knowledge around management of chronic diseases (51% vs 70%; χ²=12.49, p<0.001), food intolerances or allergies (39% vs 65%; χ²=22.97, p<0.001) and deficiencies or eating disorders (43% vs 70%; χ²=24.49, p<0.001).

Participants who reported that their diet was ‘healthy’ had significantly reduced expectations of nutrition care from personal trainers compared to participants who reported their diet to be neutral or unhealthy with regard to management of chronic disease (52% vs 70%; χ²=11.18, p=0.001), deficiencies of eating disorders (44% vs 59%; χ²=10.46, p=0.001) and vitamin and mineral requirements (70% vs 81%; χ²=8.85, p=0.003). Participants who were aged 30 years or younger reported greater expectations of personal trainers providing nutrition care.
compared to participants older than 30 years with regard to performance supplements (81% vs 70%; \( \chi^2=7.36, p=0.007 \)) as well as vitamin and mineral requirements (78% vs 67%; \( \chi^2=6.807, p=0.009 \)). Demographic associations were most often significant where >20% of participants reported that they were uncertain (neither agree nor disagree) if personal trainers should discuss the nutrition topic. These nutrition topics included deficiencies or eating disorders (n=169; 27% uncertain), food intolerances or allergies (n=169; 27% uncertain) and management of chronic disease (n=140; 22% uncertain).

Most participants expected personal trainers to be skilled or experts in collecting nutrition information (n=480, 76% agreement), creating personalised meal plans (n=426, 68% agreement) and providing nutrition counselling (n=445, 71% agreement). Most participants reported that nutrition care should only be provided when the client requests it (n=350; 56%). The majority of participants expected a personal trainer to spend up to 15 minutes discussing nutrition when providing nutrition care (n=483; 77%).

Of the 334 participants who had previously engaged a personal trainer, around three quarters reported receiving nutrition care (n=228, 76%). The most common nutrition topics discussed with a personal trainer were general healthy eating (n=277, 76%), weight loss (n=244, 69%) and muscle building (n=235, 64%). For almost every nutrition topic, a lower proportion of participants reported receiving nutrition care than those who expected nutrition care. There was a significant difference between expectations and receipt of nutrition care for general healthy eating (78.7% vs 94.4%; \( \chi^2=7.171, p=0.007 \)), weight loss (72.2% vs 86.9%; \( \chi^2=7.593, p=0.006 \)), performance supplements (77.2% vs 60.3%; \( \chi^2=27.051, p\leq0.001 \)), management of chronic disease (56.5% vs 15.6%; \( \chi^2=27.051, p\leq0.001 \)) and deficiencies or eating disorders (77.2% vs 60.3%; \( \chi^2=27.051, p\leq0.001 \)).
When nutrition care was provided, approximately half of the participants indicated that they were satisfied with the service that was delivered (n=167; 50%) and reported the nutrition care to be useful (n=190; 57%). However, fewer indicated that the nutrition care had improved their dietary behaviours (n=132; 40%). Of the 120 participants who had engaged a personal trainer and rated their diet as unhealthy or neutral, one third indicated that their dietary behaviours improved based on the nutrition care received from their personal trainer (n=40; 33%).

5.5 Discussion

This study explored client expectations of personal trainers providing nutrition care in Australia. The results suggest that clients expect personal trainers to provide nutrition care and to be knowledgeable on a range of nutrition topics. Furthermore, participants expected personal trainers to provide nutrition care that extends beyond their scope of practice and formal education. Strategies to manage clients’ expectations of nutrition care from personal trainers may be required to assist personal trainers to provide safe and effective nutrition care.

Participants expected personal trainers to provide nutrition care on many topics, some of which extended beyond the scope of practice for personal trainers. Most concerning was that approximately half the participants expected personal trainers to provide nutrition care for complex nutrition topics such as the treatment and management of chronic diseases. Clients’ idealistic expectations regarding this nutrition care may be due to a lack of awareness of the complexity of chronic disease management, coupled with the perception that personal trainers appear capable of providing a template to achieve health through physical activity and diet. Previous researchers have suggested that personal trainers may be perceived as the ‘gatekeepers’ to health and fitness with their position (and possibly physique) providing a sense of authority because they have successfully controlled modifiable factors associated
with health (exercise and diet)\textsuperscript{26}. The personal trainer/client relationship is unusual and given the amount of time they spend together to achieve health related goals and the opportunity to describe and discuss dietary behaviours, nutrition care provided may be opportunistic\textsuperscript{25, 27}.

Engaging a personal trainer did not influence expectations of nutrition care. Personal trainers have reported they are often asked about nutrition and feel confident to respond to clients\textsuperscript{33}. Such interactions may reinforce client expectations that personal trainers are able to provide nutrition care for any topic. While it is promising to note that few clients reported receiving nutrition care that is considered beyond the scope of practice, such as nutrition for chronic disease management, many still expected a personal trainer to be able to provide such nutrition care. This may indicate that personal trainers are aware of their boundaries and avoid providing nutrition care beyond translation of national guidelines. Alternatively, personal trainers may have limited opportunity to provide nutrition care for topics such as chronic disease or food allergies due to lack of session time or lack of clients with chronic conditions need. The majority of participants in this study were healthy young adults and the opportunity for personal trainers to provide such nutrition care may be limited in this sample. Still, clients expected that a personal trainer could provide nutrition care that they did not receive. As such, it appears that expectations of personal trainers may be influenced more by the general perception that they are panaceas of health information than by previous experience.

Expectations to provide nutrition care beyond translating the national dietary guidelines compromises a personal trainer’s ability to work within the industry defined scope of practice. The education personal trainers currently receive is too short to adequately support the clinical reasoning required to provide nutrition care for complex health issues or for individual dietary manipulation\textsuperscript{30, 95, 96}. Indeed, several case reports highlight the negative
client health outcomes that can result from personal trainers providing nutrition care beyond
the recommended scope of practice \textsuperscript{35, 36}. As such, changing clients’ expectations of nutrition
care from personal trainers may assist a reduction in one component of risk associated with
negative client health outcomes. Participants who did not expect personal trainers to provide
nutrition care on topics that extended beyond the fitness professional scope of practice
reported higher levels of education or self-perceived healthfulness which may indicate higher
nutrition and health literacy \textsuperscript{122}. As such, public health messages that aim to improve nutrition
and health literacy of the general public, with a focus on information sourcing, may help to
manage expectations of personal trainers and direct individuals to the most appropriate source
of information for their specific nutrition concerns.

Given the prevalence of poor dietary behaviours in Australia and internationally,
opportunities to promote healthy dietary behaviours should be explored. Nutrition care
provided by primary health care workers, such as general practitioners, nurses and allied
health workers, is often held in high regard \textsuperscript{11}. However, health professionals often report
barriers to providing nutrition care such as perceived lack of patient readiness \textsuperscript{61, 62}. In
contrast, this study suggests that individuals expect to receive nutrition care from personal
trainers and 40\% of participants reported positive dietary changes as a result of nutrition care
from their personal trainer. Expectations of nutrition care in the personal training context
indicate that individuals are likely to be accepting of nutrition care from a personal trainer
that they have engaged and therefore personal training is an important context in which
nutrition care should be provided. It is important that personal trainers clearly communicate
the boundaries of nutrition care they can provide and enable their clients to access further
nutrition care through appropriate referral to a health professional. Reported referrals between
personal trainers and health professionals, such as dietitians, have historically been low \textsuperscript{123}.
Increased collaboration between fitness and health professionals is needed to deliver safe and effective nutrition care when individuals are most willing to receive it.

This is the first study that has explored expectations of clients and potential clients with regard to nutrition care provided by personal trainers. The data was not representative of the general Australian population with over representation of females, educated individuals and those within a healthy weight range. However, fitness industry data shows that the majority of personal trainer clients are female (~70%) and the use of fitness services by those above the healthy weight range is limited. As such, while not representative of the general population, current respondents appear to be aligned with a typical client-base for personal trainers in Australia. An unavoidable response bias may be present in the data, where respondents were more interested in nutrition and/or fitness, and therefore reported greater expectations of personal trainers. The final limitation of this paper is that it did not consider awareness of the nutrition components of the fitness professional scope of practice. Further research into awareness and acceptability of the current Fitness Australia scope of practice for registered fitness professionals is needed. This should be conducted among both the personal trainer client base and personal trainers.

Overall, personal trainers are expected to be knowledgeable on, and discuss, a wide range of nutrition topics, some of which extend beyond their scope of practice. These findings indicate that client expectations of personal trainers to provide nutrition care may contribute to the industry identified risk of personal trainers providing nutrition care beyond their recommended scope of practice, which may result in poor health outcomes for clients. Still, personal training is clearly an important context in which healthy dietary behaviours should be promoted. As such, managing client expectations of nutrition care from personal trainers is needed. Personal trainers should be supported to clearly communicate their roles and
boundaries with regard to nutrition care and should engage with health professionals to enable clients to access appropriate nutrition care that meets their needs.
Chapter 6

Study 3 - Personal trainers are confident in their ability to provide nutrition care: A cross-sectional investigation

6.1 Abstract
6.2 Introduction
6.3 Methods
6.4 Results
6.5 Discussion

Reader’s Note: This chapter includes a co-authored paper. The bibliographic details of the co-authored paper, including all authors, are:


The candidate’s contribution to this publication involved:

- Study conception
- Study design
- Data collection
- Data analysis and categorisation of the data into a usable format
- Interpretation of the data
- Writing of the manuscript

(Signed): (Date): 12/06/2017

Katelyn Barnes

(Countersigned): (Date): 12/06/2017

Supervisor: Associate Professor Ben Desbrow

(Countersigned): (Date): 12/06/2017

Supervisor: Dr Lauren Ball
Personal trainers are confident in their ability to provide nutrition care: A cross-sectional investigation

6.1 Abstract

Objective: To measure the self-perceived competence of Australian personal trainers in providing nutrition care.

Study Design: Cross-sectional online survey.

Methods: A validated survey was used to measure confidence in the ability to provide nutrition care among a snowball sample of 142 Australian based personal trainers. The survey used 5-point Likert Scale statements across four nutrition-related constructs: knowledge, skills, communication and counselling, and attitudes. Scores for each construct were averaged and summed to provide a self-reported nutrition competence score as a percentage. Pearson chi square analyses were used to identify associations between demographic variables and competence scores, and associations between construct scores.

Results: Personal trainers felt confident to provide nutrition care for all clients (mean score 76%; ‘very confident’). Greater confidence in nutrition knowledge was seen in personal trainers with greater experience ($\chi^2= 6.946, p= 0.008$) and education higher than a Certificate IV ($\chi^2=5.079, p=0.024$). Greater confidence in nutrition knowledge was also associated with greater confidence in nutrition skills ($\chi^2=49.67, p=<0.001$) and more favourable attitudes towards providing nutrition care ($\chi^2=4.73, p=0.03$).

Conclusions: Personal trainers feel confident in their ability and show favourable attitudes towards providing nutrition care to clients. This workforce has the potential to support lifestyle modification for chronic disease prevention.
6.2 Introduction

Chronic disease imposes a large burden on health worldwide \(^1\). Poor dietary behaviours and physical inactivity influence the development of many chronic diseases and are estimated to contribute to 10\% of the global burden of disease \(^1\). The prevalence of poor dietary behaviours and physical inactivity is considerable in many countries. For example, the majority of adults in the USA, UK and Australia consume less fruit and vegetables than recommended \(^4\text{-}\text{6, 129}\). Furthermore, less than half of adults in the USA, UK and Australia meet the recommended levels of physical activity \(^7\text{-}\text{9, 129}\). Clearly, strategies that simultaneously facilitate adults to improve dietary behaviours and increase physical activity levels are important to prevent and manage chronic disease \(^49\).

Personal trainers are a large workforce of exercise professionals who provide guidance, instruction and motivation for individuals initiating or engaging in physical activity \(^23\text{-}\text{9, 111}\). As such, personal trainers have been identified as ideally placed to provide basic nutrition care to their clients in line with national dietary guidelines \(^21\text{-}\text{9, 30}\). In addition, individuals who are attempting to improve their physical activity behaviours are likely to seek advice on other health topics including dietary behaviours \(^24\text{-}\text{5}\). In this context, nutrition care refers to any practice conducted by a professional in an attempt to facilitate an individual to improve their dietary behaviours \(^10\).

A scope of practice which limits the provision of nutrition care by personal trainers has been recommended by the International Confederation of Registered Exercise Professionals (ICREPs) \(^28\). For example, in Australia the regulating body (Fitness Australia) has created a national scope of practice document for exercise professionals that states personal trainers may provide basic nutrition information in line with the national dietary guidelines \(^29\). However, Australian and international research has shown that more than three quarters of
personal trainers provide nutrition care beyond this recommended scope of practice \(^{30-32}\). The provision of nutrition care beyond the recommended scope of practice has been identified as a major industry risk due to the potential for inappropriate or misleading nutrition advice to result in negative health outcomes for individuals \(^{33}\). A primary concern raised within, and externally, to the fitness industry is a perceived lack of competence in providing nutrition care, mostly due to inadequate education in nutrition \(^{33, 34}\). However, the competence of personal trainers to provide nutrition care has not been widely investigated.

Competence refers to the ability to perform a task, and comprises specific knowledge, skills and attitudes that facilitate appropriate task performance \(^{52}\). Competency standards are predominantly used in health care to define the minimum quality standard for professional practice and to guide education and training \(^{52, 53}\). The direct measurement of competence is challenging. Significant time and resources would be required to observe or monitor the provision of nutrition care, and such study designs are likely to introduce bias. Alternative measurements of nutrition care outcomes could be investigated; though, in contexts such as personal training the outcomes of care are multifaceted \(^{27, 29, 52, 90}\). For example, nutrition care provided by personal trainers should facilitate clients to improve their dietary behaviours in a safe, evidence-based manner. However, the factors influencing dietary behaviour change over time and any improvements in diet quality may not be directly associated with nutrition care provided by a personal trainer. In these contexts, self-perceived competence refers to a subjective rating of personal ability that has been demonstrated to predict actual competence when the constructs under investigation are clearly defined \(^{90}\).

Investigating the self-perceived competence of personal trainers may help to clarify the concerns previously raised of low-competence in providing nutrition care. This understanding will also help to identify areas in which personal trainers require further education or support.
for competent care. Therefore, the aim of this study was to explore the self-perceived competence of Australian personal trainers in providing nutrition care to clients.

6.3 Methods

A cross-sectional online survey was conducted on personal trainers in Australia. The study was approved by the Griffith University Human Research Ethics Committee (GU14/49/HREC).

6.3.1 Participants and Recruitment

Potential participants were Australian residents who identified as working as a personal trainer. Social media networks were used to access a snowball sample of personal trainers within Australia. A link to the study details, researcher contact details and online survey was posted on social media sites of Sports Dietitians Australia and the Australian Institute of Fitness. The survey remained open from February to June, 2015.

6.3.2 Instruments

The online survey was adapted from a validated nutrition competence tool (NUTCOMP) which has been described in detail elsewhere. To the authors’ knowledge, this tool is the only validated survey for evaluating the self-perceived competence to provide nutrition care that has demonstrated strong correlation for face validity, content validity, construct validity, and test-retest reliability. The tool was validated among health professionals (including non-nutrition focused health professionals such as radiographers and speech pathologists) to ensure face validity and sensitivity, but is yet to be validated for use in non-health professions. Briefly, the NUTCOMP tool consists of six sections designed to measure the confidence of health professionals to provide nutrition care to both healthy clients and clients with chronic disease. Confidence in the ability to complete a task is an indicator of self-
perceived competence to complete a task as per the self-determination theory \(^{89, 90}\). For this study, the first section of the tool (demographic information) was adapted to include information relevant to the fitness industry. This included qualifications, registration with professional bodies, years of experience, type of employment, gender and age group. Sections two, three, and four used 5-point Likert scale questions to rate confidence in the constructs of nutrition knowledge, nutrition skills, and nutrition communication respectively. Answer options ranged from ‘not confident at all’ to ‘extremely confident’, with a mid-range of ‘somewhat confident’. Section five used 5-point Likert Scale statements to measure participants’ attitudes towards providing nutrition care, such as ‘Encouraging my clients to eat healthy foods is an effective use of my professional time’ with answers ranging from ‘strongly disagree’ to ‘strongly agree’. The final section collected other relevant information such as participants’ previous nutrition education, as well as previous professional and personal experience with nutrition issues.

The adjusted NUTCOMP tool was piloted for face validity among five personal trainers from three separate fitness businesses. This involved personal trainers providing verbal feedback on interpretation of each question before answering and discussing any wording issues. Minor changes to the text, prior to data collection, were made in accordance with consistent feedback received.

**6.3.3 Data Analysis**

All analyses were conducted with SPSS v.22 \(^{119}\). A chi square goodness of fit test was performed to identify if gender, age or level of education of participants in this sample differed to a larger sample of Australian exercise professionals \(^{111}\). In addition, a chi square goodness of fit test was performed to identify if the gender and level of education of
Participants from this sample differed to the distribution from a sample of exercise professionals from a separate, but similar study. Competence scores were calculated for each question based on the following number allocation (1=Not Very Confident at All, 2=Not Very Confident, 3=Somewhat Confident, 4=Very Confident, 5=Extremely Confident; 1=Completely Disagree, 2=Somewhat Disagree, 3=Neither Agree nor Disagree, 4=Somewhat Agree, 5=Completely Agree). Each question was summed to provide each participant with a score for each construct. An overall score was then produced by summing the average of knowledge, skills, communication/counselling and attitudes construct scores (possible score range from 35-175). Each score was converted to a percentage to allow comparison across constructs. The associations between the different constructs of self-perceived competence (knowledge, skills, communication/counselling and attitudes) were calculated using Pearson’s chi squared analyses. Additionally, the associations between self-perceived nutrition competence and participants’ gender, age, years working as a personal trainer, participation in nutrition-related professional development and level of health and fitness related education were investigated using Pearson’s chi squared analyses. Statistical significance was considered when $p\leq0.05$.

### 6.4 Results

A total of 207 personal trainers opened the NUTCOMP survey, with 143 (69%) completing the survey (65% female; 35% male). However, an exact response rate is unknown due to the untraceable nature of social media snowballing. The majority of participants were registered with Fitness Australia (80%) and worked as a personal trainer casually (50%) or full time (48%). Table 8 represents the demographic characteristics of participants.
Table 8: Summary table of demographic characteristics of participants, years of experience as a personal trainer and participation in extra nutrition education (n=143)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>93 (65.0)</td>
</tr>
<tr>
<td>Male</td>
<td>50 (35.0)</td>
</tr>
<tr>
<td>Age group</td>
<td></td>
</tr>
<tr>
<td>25 years or younger</td>
<td>29 (20.2)</td>
</tr>
<tr>
<td>26-34 years</td>
<td>86 (60.1)</td>
</tr>
<tr>
<td>35-44 years</td>
<td>21 (14.7)</td>
</tr>
<tr>
<td>45-54 years</td>
<td>25 (17.5)</td>
</tr>
<tr>
<td>55-64 years</td>
<td>4 (2.8)</td>
</tr>
<tr>
<td>65 years or older</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>Highest level of health related education attained</td>
<td></td>
</tr>
<tr>
<td>Certificate III</td>
<td>5 (3.5)</td>
</tr>
<tr>
<td>Certificate IV</td>
<td>86 (60.1)</td>
</tr>
<tr>
<td>Diploma</td>
<td>21 (14.7)</td>
</tr>
<tr>
<td>Tertiary degree (Bachelor, Postgraduate, Doctorate)</td>
<td>31 (21.6)</td>
</tr>
<tr>
<td>Years of experience working as a personal trainer</td>
<td></td>
</tr>
<tr>
<td>0 – 5 years</td>
<td>94 (65.7)</td>
</tr>
<tr>
<td>5 + years</td>
<td>49 (34.3)</td>
</tr>
<tr>
<td>Previous participation in continuing education in nutrition</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>97 (67.9)</td>
</tr>
<tr>
<td>No</td>
<td>46 (32.1)</td>
</tr>
</tbody>
</table>

Representation of the sample was challenging to estimate as there is no demographic data available for personal trainers in Australia. However, in comparison to the 2011 fitness industry report which surveyed all exercise professionals, including personal trainers, this sample had an over representation of females (65% vs 55%; $\chi^2 = 5.818$ df=1; p=0.016) and an over representation of participants within the 45-54 year age group (17% vs 13%; $\chi^2 = 7.168$ df = 1; p=0.007). Furthermore, in comparison to the 2011 fitness industry report, this study sample had a significantly larger proportion of participants with a level of education greater than the Certificate III or IV in Fitness (36% vs 5%; $\chi^2 = 296.139$; df = 1; p<0.001). This may be due to the recruitment strategy that included a Sports Dietetics website. However, when comparing participants from this survey to another recent survey of
Australian fitness professionals (12), there were no significant differences for gender or level of education of participants (p>0.05).

Table 2 describes the four constructs of the survey, which are participants’ confidence in their nutrition knowledge, nutrition skills, ability to communicate with clients about nutrition and attitudes towards providing nutrition care. In addition, Table 9 shows the associations between demographic characteristics and the four survey constructs, as well as associations within the constructs.

Table 9: Nutrition competence scores and associations with participants’ demographic characteristics

<table>
<thead>
<tr>
<th>Construct</th>
<th>Score % (SD)</th>
<th>Association with other constructs</th>
<th>Association with demographic characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>65 (15)</td>
<td>Skills b</td>
<td>Experience d</td>
</tr>
<tr>
<td>Skills</td>
<td>70 (15)</td>
<td>Attitudes c</td>
<td>Education e</td>
</tr>
<tr>
<td>Communication</td>
<td>83 (11)</td>
<td>Knowledge b</td>
<td>Education e</td>
</tr>
<tr>
<td>Attitudes</td>
<td>85 (10)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>TOTAL</td>
<td>76 (5)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

a Only significant Chi Square results reported.
b Participants who reported greater confidence in their nutrition knowledge more frequently reported higher confidence in nutrition skills (χ²(1) = 49.67; p<0.001).
c Participants who reported greater confidence in their nutrition knowledge more frequently reported stronger attitudes towards the provision of nutrition care (χ²(1) = 4.73; p=0.03).
d Participants who reported more than 5 years of personal trainer experience more frequently reported greater confidence in their nutrition knowledge than participants who reported less than 5 years of experience (χ²(1) = 6.95; p=0.008).
e Participants who reported having completed a Diploma of Fitness or tertiary education degree in health and fitness more frequently reported greater confidence in their nutrition knowledge and in nutrition skills than participants who reported having a Certificate IV in Fitness or less (χ²(1) = 5.08; p=0.024 and χ²(1) = 11.7; p<0.001 respectively).

The self-perceived nutrition knowledge construct elicited the lowest score of 65% (mode=somewhat confident). However, participants who were confident (somewhat, very or extremely confident) in their nutrition knowledge frequently reported confidence in their nutrition skills (somewhat, very or extremely confident) (χ²=49.67; p<0.001), and had
favourable attitudes towards providing nutrition care ($\chi^2=4.727; p=0.03$). Participants who had completed a Diploma of Fitness or tertiary fitness related degree more frequently reported being confident (somewhat, very or extremely confident) in their nutrition knowledge than those who had only completed a Certificate III or IV in Fitness ($\chi^2=5.079, p=0.024$). Finally, personal trainers who had been practising for more than 5 years more frequently reported being confident (somewhat, very or extremely confident) in their nutrition knowledge than personal trainers who had been practising for less than 5 years ($\chi^2=6.946, p=0.008$). Participation in nutrition-related professional development courses did not significantly influence confidence in nutrition knowledge ($p>0.05$).

Participants perceived themselves as having moderately high levels of nutrition skills, with an average score of 70% (mode=very confident). Those who had completed a Diploma of Fitness or a tertiary fitness related degree more frequently reported being confident in their nutrition skills (somewhat, very or extremely) than those who had only completed a Certificate III or IV in Fitness ($\chi^2=11.664, p<0.001$). Participation in nutrition-related professional development courses did not significantly influence confidence in nutrition skills ($p>0.05$) and no other significant demographic associations were observed for the construct of nutrition skills ($p>0.05$).

The majority of participants (n=117, 86%) reported feeling ‘very confident’ or ‘extremely confident’ in their communication and counselling techniques, with an average score of 83% (mode=extremely confident). The statement for which the majority of participants reported ‘extremely confident’ was ‘to maintain a non-judgemental attitude in discussions with patients/clients about the food they eat’ (mean=4.4±0.6 out of 5). Participation in nutrition-related professional development courses did not significantly influence confidence in communication and counselling ($p>0.05$). No associations were observed between
participants’ demographic characteristics and their self-perceived ability to perform nutrition-related communication and counselling (p>0.05).

Overall, attitudes towards the provision of nutrition care were favourable, with an average score of 85% (mode=strongly agree). Nearly all participants (n=136, 95%) agreed or strongly agreed that it is important to encourage clients to eat healthy foods and that providing nutrition care is an effective use of their professional time. Furthermore, approximately half of participants (n=62, 43%) agreed or strongly agreed that the provision of nutrient specific advice for the management of chronic disease was within their scope of practice. Participation in nutrition-related professional development courses did not significantly influence attitudes towards nutrition care (p>0.05). No associations were observed between participants’ demographic characteristics and their attitudes towards nutrition care (p>0.05).

The 5-point Likert scale statement eliciting the highest score was ‘If the topic arises, it is important that I encourage my clients to eat healthy foods’ (mean=4.7±0.4). The 5-point Likert scale statement eliciting the lowest score across all constructs was ‘knowledge of the most recently published peer-reviewed evidence regarding nutrition and chronic disease’ (mean=2.48±1.1), closely followed by ‘knowledge of how foods and nutrients interact with medications for chronic disease’ (mean=2.65±0.98). Most participants (n=115, 80%) agreed or strongly agreed that they needed further nutrition education to support them in their role.

6.4 Discussion

This study investigated the self-perceived nutrition competence of Australian personal trainers. Overall, personal trainers reported feeling confident in their nutrition knowledge, nutrition skills, as well as nutrition-related communication and counselling techniques, indicating perceived competence in providing nutrition care. Furthermore, personal trainers
demonstrated favourable attitudes towards the provision of nutrition care to healthy clients and clients with chronic lifestyle conditions (including type 2 diabetes and cardiovascular disease). This is important because personal trainers have considerable access to clients who are likely to be receptive to nutrition care. However, personal trainers receive varying levels of nutrition education, which may affect their level of actual nutrition knowledge and understanding. It is important to recognise that personal trainers do not receive formal education on chronic disease or underlying nutrition-related metabolic functions and are not supported by their professional association to provide nutrition care to clients beyond basic translation of the national dietary guidelines. However, poor dietary behaviours are linked to the development of chronic disease and the provision of basic nutrition care from any health related professional may result in positive dietary outcomes for clients looking to improve lifestyle behaviours. Personal trainers have been shown to provide nutrition care covering a wide range of topics including both basic translation of the national dietary guidelines as well as chronic disease management and are now known to be confident in their ability to provide nutrition care. Still, actual competence of personal trainers to provide nutrition care remains unclear. While previous studies have shown correlation between perceived competence and actual competence of health professionals, this has not been confirmed in other settings such as personal training. As such, further work to investigate actual knowledge, skills and attitudes of personal trainers may be warranted to support the provision of safe and effective nutrition care within the personal training scope of practice.

The most effective context in which to receive nutrition care is not clear. Nutrition care from primary health care workers, such as general practitioners, nurses and allied health workers, is often held in high regard. However, major barriers to the provision of nutrition care in
these settings are perceived lack of time to provide nutrition care and a lack of confidence to provide effective nutrition care (i.e. lack of perceived competence)\textsuperscript{60-62, 127}. This study identified that personal trainers perceive themselves as competent to provide nutrition care and feel that discussing nutrition is an effective use of their professional time. This may be due to the greater frequency with which teachable moments occur between personal trainers and clients, related to the amount of time spent consulting and the close relationship between improving fitness and dietary behaviours\textsuperscript{24, 25}. As such, personal trainers may experience fewer barriers to the provision of nutrition care than some primary health care workers. Alternatively, personal trainers may be over confident in their ability, therefore overestimating their competence to provide nutrition care (i.e. the Dunning-Kruger Effect\textsuperscript{128}). Therefore, personal trainers may be a useful workforce to help improve dietary behaviours, but further investigation into actual competence of personal trainers to provide safe and effective nutrition care is warranted.

Communication and counselling was the construct in which personal trainers were most confident. This may be because personal training is a service which requires a strong focus on client-centred care and communication\textsuperscript{27, 100}. Alternatively, confidence may have arisen from the frequency with which personal trainers are asked about, and discuss, nutrition with clients\textsuperscript{33}. This high level of confidence in communication could be used to support education for personal trainers, which could focus on how to communicate the limitations of their scope of practice to clients, and to increase communication with relevant health professionals. Communication between health professionals and personal trainers will likely assist with the coordination of care, which may better support positive and sustainable health outcomes for health clients.
Personal trainers in this study were less confident in their nutrition knowledge compared with their nutrition skills and nutrition attitudes. While personal trainers did not rate their knowledge as low (score=65%; mode= somewhat confident), they were less confidence in their knowledge of, and ability to access, up-to-date, evidence-based nutrition information. It is important to note that actual knowledge of personal trainers remains unclear. However, previous research indicates that personal trainers may use unreliable sources to support their knowledge such as textbooks (which may not be up-to-date), course notes, the internet and word of mouth. Interestingly, this study found participation in nutrition-related professional development did not influence confidence in nutrition knowledge. It is not clear what is covered in all nutrition-related professional development courses, however lower confidence in the ability to access up-to-date information may indicate that this is not covered sufficiently in current exercise professional education. As such, additional education should focus on information sourcing and critical analysis of nutrition content, which may assist personal trainers to become more confident to source up-to-date, evidence-based information to provide nutrition care.

Higher confidence in nutrition knowledge was associated with higher confidence in both nutrition skills and more favourable attitudes towards nutrition. It is possible that providing further nutrition training (leading to increased confidence in nutrition knowledge) may encourage personal trainers to feel capable of providing nutrition care beyond their recommended scope of practice. Any education to develop nutrition knowledge and skills of personal trainers would need to focus on the limitations of a personal trainer’s nutrition knowledge, the boundaries of their role and the importance of a multi-disciplinary approach to client care. Creation of specific competency standards for personal trainers may provide a mandate for the development of nutrition knowledge and skills within baseline
fitness education and may help to direct personal trainers to appropriate professional
development once registered. For example, ‘the ability to identify and apply appropriate
dietary data collection methods (food diary, food recall and food frequency questionnaires)
to support client dietary behaviour change in line with the national dietary guidelines’, as a
competence standard, may help to define expected nutrition knowledge and skills of personal
trainers and may support personal trainers to provide evidence-based nutrition care while
staying within their scope of practice.

Personal trainers feel confident in their ability to provide nutrition care and show favourable
attitudes towards providing nutrition care to clients with and without chronic disease. This
workforce has the potential to support clients to simultaneously improve their physical
activity and dietary behaviours. To assist personal trainers in the provision of safe and
effective nutrition care within their current scope of practice, education to improve skills such
as critical analysis and information sourcing should be considered. Defined nutrition
competencies may further reinforce this approach by providing guidance for personal trainers
to develop their knowledge and skills, while cognisant of their professional limitations.
Chapter 7

Study 4 - Personal trainer perceptions of providing nutrition care to clients: A qualitative exploration

7.1 Abstract

7.2 Introduction
7.3 Methods
7.4 Results
7.5 Discussion

Reader’s Note: This chapter includes a co-authored paper. The bibliographic details of the co-authored paper, including all authors, are:


The candidate’s contribution to this publication involved:

- Study conception
- Study design
- Data collection and transcription
- Data analysis
- Interpretation of the data
- Writing of the manuscript

(Signed): (Date): 12/06/2017

Katelyn Barnes

(Countersigned): (Date): 12/06/2017

Supervisor: Associate Professor Ben Desbrow

(Countersigned): (Date): 12/06/2017

Supervisor: Dr Lauren Ball
Personal trainer perceptions of providing nutrition care to clients: A qualitative exploration

7.1 Abstract

**Objective:** To explore the context in which personal trainers provide nutrition care, by understanding personal trainers’ perceptions of nutrition care in relation to their role and scope of practice.

**Study Design:** Semi-structured telephone interviews

**Methods:** Telephone interviews were conducted with 15 personal trainers working within Australia. Thematic analysis was used to identify key themes, with triangulation of themes between three established researchers.

**Results:** All personal trainers reported to provide nutrition care and that nutrition care was an important component of their role. The nutrition care that was provided by personal trainers was diverse and mostly supported by anecdotal evidence rather than the national nutrition guidelines. Most personal trainers interviewed were unaware or uncertain of the scope of practice for personal trainers. When presented with the nutrition scope of practice statements, all personal trainers interpreted the text differently. Some personal trainers reported a gap between the nutrition knowledge they received in their formal education and the knowledge they needed to optimally support their clients to adopt healthy dietary behaviours.

**Conclusions:** Overall, the personal training context is likely to be conducive to providing nutrition care. Despite concerns about competence, personal trainers have not modified their nutrition care practices. To ensure personal trainers provide nutrition care in a safe and
effective manner, greater enforcement of the scope of practice is required as well as clear
nutrition competencies or standards to be developed during training.

7.2 Introduction

Chronic disease is one of the greatest challenges faced by healthcare systems worldwide \(^1,117\). Sedentary lifestyles and poor dietary behaviours are common modifiable risk factors for chronic disease \(^1\). The prevalence of poor dietary behaviours and physical inactivity is considerable in many countries. For example, less than half of adults in Australia, the USA and the UK meet the recommended levels of physical activity and the majority consume less fruits and vegetables than recommended for optimal health \(^4-9\). As such, strategies that simultaneously facilitate adults to improve dietary behaviours and increase physical activity levels are needed to prevent and manage chronic disease.

Personal trainers have been identified as being ideally placed to provide a combination of physical activity guidance and basic nutrition care \(^21\). This is because individuals who are attempting to improve their physical activity behaviours are likely to seek advice on other health topics including dietary behaviours \(^24,25\). Nutrition care in this context refers to any practice conducted by a professional in an attempt to facilitate improvements in an individual’s dietary behaviours \(^10\). International standards for personal training encourage the provision of nutrition care in line with national guidelines \(^28\). This highlights the accepted role of personal trainers in providing nutrition care.

ICREPs support international recognition of qualifications and reciprocal practice for registered fitness professionals in Australia, Europe, New Zealand, the United Arab Emirates, the UK and the USA. Registration for fitness professionals, including personal trainers, is voluntary in all ICREPs recognised countries and requires a minimum of a European Qualifications Framework (EQF) level 4 certification in exercise or fitness (average length 6
months). In Australia, this involves a minimum of a Certificate III and IV in Fitness. Registered personal trainers are required to complete a set number of professional development points per registration cycle and be aware of the national dietary guidelines for their country. In Australia, this includes knowledge and application of the Australian Guide to Healthy Eating.

The largest fitness professional registering body in Australia, Fitness Australia, recommends that personal trainers provide ‘basic healthy eating advice through application of nationally endorsed nutrition guidelines’. Fitness professionals agree to abide by this scope of practice when they register (or re-register). However, basic healthy eating advice is not clearly defined and appropriate sources for national guidelines are not included. The provision of nutrition care outside this scope of practice has been identified as a major risk by professionals within and external to the industry. This is due to the potential for inappropriate or misleading nutrition advice to result in negative health outcomes for clients. Recent reports call for stricter enforcement of the scope of practice by regulating bodies as more than three quarters of personal trainers have been shown to provide nutrition care outside the recommended scope of practice.

It is important to understand the context in which nutrition care is provided to ensure personal trainers and clients receive the appropriate information and support required to provide safe and effective nutrition care. The environment in which personal training occurs (one-on-one personalised fitness and health focussed sessions) is likely to be conducive to nutrition care, which creates an opportunity to improve the dietary behaviours of personal training clients. However, there is limited information regarding the current level of awareness and interpretation of the recommended scope of practice for personal trainers. This study aims to explore personal trainers’ perceptions of their role and scope of practice with regard to
providing nutrition care. These results may inform strategies to help support personal trainers to provide effective nutrition care within their scope of practice.

7.3 Methods

This study used a cross-sectional, qualitative design to capture perceptions and experiences of personal trainers in providing nutrition care. Potential participants were any personal trainer within Australia who had previously trained clients, had completed a fitness education course and was eligible to register as a personal trainer. Ethical approval for this study was granted by Griffith University Human Ethics Research Committee (14/49/HREC).

7.3.1 Participants and recruitment

Convenience and snowball sampling were used to recruit participants. Contact details for a sample of personal trainers were obtained from a concurrent study where participants provided consent to be contacted about other studies (See Chapter 6). The sampling strategy aimed to recruit personal trainers with a wide range of ages, locations and levels of experience. Participants must have completed a Certificate IV in Fitness or equivalent, but were not required to be registered with a fitness association. Participants were sent an email with a plain language statement explaining the purpose of the study. A maximum of three reminder emails were sent to each participant. Fifty-six personal trainers were contacted. Potential participants were encouraged to contact the research team to arrange an interview at a mutually convenient time.

7.3.2 Instruments

Each participant was involved in one semi-structured interview lasting up to 30 minutes between March and June 2015. Semi-structured questions explored nutrition care in personal training across four sections as outlined in Table 10.
<table>
<thead>
<tr>
<th>Area of Inquiry</th>
<th>Question</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived role and expectations</td>
<td>How important do you believe nutrition is for your clients?</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>Can you describe the role that nutrition care plays in the services you provide?</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>What do you think your clients expect from you (and other personal trainers) with regard to food and nutrition?</td>
<td>Open</td>
</tr>
<tr>
<td>Current nutrition practices</td>
<td>How does nutrition first come up with a client?</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>Do you follow up on nutrition with a client after it is first discussed? How would you go about that?</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>Could you tell me about any nutrition principles that you advocate for all of your clients? For example, do you suggest vegetarianism or low carb diets?</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>How does this compare to your personal nutrition beliefs and practices?</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>Can you describe how you would assess nutrition with a typical client?</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>Do you have a consistent structure that you use when first discussing nutrition?</td>
<td>Open</td>
</tr>
<tr>
<td>Opinion of the Australian Guide</td>
<td>Are there any nutrition tools that you prefer to use with your clients?</td>
<td>Open</td>
</tr>
<tr>
<td>Healthy Eating</td>
<td>For example, the Mediterranean food pyramid or messages such as two &amp; five.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What do you think about the Australian Guide to Healthy Eating and the dietary guidelines in general?</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>Do you use them with clients?</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>If there was a tool that helped to apply the principles of basic healthy eating, how useful and practical do you think that could be for Australian Personal Trainers and specifically your practice?</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>How do you think it would impact the profession as a whole?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What do you think it should include?</td>
<td></td>
</tr>
<tr>
<td>Fitness Australia and the scope</td>
<td>Are you registered with Fitness Australia?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>of practice document</td>
<td>Are you aware of the “Fitness Australia position statement for the role and responsibilities of all registered exercise professionals”?</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td>If yes…</td>
<td>Open</td>
</tr>
<tr>
<td></td>
<td>Can you tell me how it has impacted your practice as a personal trainer?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Can you describe what “basic healthy eating advice” might encompass?</td>
<td>Open</td>
</tr>
</tbody>
</table>
Section one explored the perceived role of personal trainers with regard to food and nutrition. This included their perception of nutrition and food in personal training and their perception of client expectations. Section two probed the current nutrition care practices of personal trainers. This included the environment in which nutrition care takes place and the context of nutrition discussions with clients. Section three considered opinions of the current Australian dietary guidelines. This included questions about awareness and perception of the Australian Guide to Healthy Eating and explored alternative preferences for sources of nutrition information. The final section investigated opinions of the Fitness Australia scope of practice document. This included questions about awareness, impact and interpretation of the nutrition-related text and minimum education standards. Additional questions such as ‘could you expand on what that means to you and/or for your clients?’ were used to probe for more detailed responses when required. Interview questions were piloted with 6 exercise professionals (3 accredited exercise physiologists and 3 personal trainers) to ensure face validity. Minor changes to the text were made in accordance with the consistent feedback received prior to data collection.

7.3.3 Data analysis

All interviews were recorded with consent and transcribed by one researcher to ensure consistency. Interviews were conducted until data saturation was reached. For this study, data saturation was considered to have been reached when no new themes were identified with new interviews. Consistent preliminary themes were identified from 12 interviews and recruitment for participants was stopped at 15 participants. Thematic analysis was used for each interview to develop an in depth understanding of participant responses. One researcher conducted initial coding and development of themes. Confirmation and agreement of themes was achieved through discussions with the research team. Quotes were extracted to support
common and dissident viewpoints of participants. Selected quotes are presented alongside the results.

7.4 Results

Fifteen interviews with personal trainers were completed. Demographic characteristics of participants are displayed in Table 11. Participants were aged from 24 years to 55 years, with an average (±SD) of 38±11 years. One participant was not registered with Fitness Australia or any equivalent industry body. The majority of participants were female (73%) and the average number of years’ experience as a personal trainer was 4.0±3.8 years. Four years working in the fitness industry is considered ‘experienced’ and this is not surprising given the high attrition within the fitness workforce. Approximately 50% of fitness professionals exit the workforce 5 years post registration and more than 90% exit by 12 years.  

Table 11: Summary of the demographic characteristics of interview participants (n=15)

<table>
<thead>
<tr>
<th>Participant Number</th>
<th>Gender</th>
<th>Years of Experience as a personal trainer</th>
<th>Registered with Fitness Australia</th>
<th>Location (Australian State)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>2.5</td>
<td>Yes</td>
<td>VIC a</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>5.5</td>
<td>Yes</td>
<td>VIC a</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>2</td>
<td>Yes</td>
<td>NSW b</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>8</td>
<td>Yes</td>
<td>NSW b</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>15</td>
<td>Yes</td>
<td>NSW b</td>
</tr>
<tr>
<td>6</td>
<td>F</td>
<td>3</td>
<td>Yes</td>
<td>QLD c</td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>2.5</td>
<td>Yes</td>
<td>NSW b</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>6</td>
<td>Yes</td>
<td>NSW b</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>0.5</td>
<td>Yes</td>
<td>NSW b</td>
</tr>
<tr>
<td>10</td>
<td>F</td>
<td>2.5</td>
<td>No</td>
<td>TAS d</td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>1</td>
<td>Yes</td>
<td>VIC a</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>5</td>
<td>Yes</td>
<td>NSW b</td>
</tr>
<tr>
<td>13</td>
<td>F</td>
<td>2</td>
<td>Yes</td>
<td>QLD c</td>
</tr>
<tr>
<td>14</td>
<td>F</td>
<td>3.5</td>
<td>Yes</td>
<td>VIC a</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>0.5</td>
<td>Yes</td>
<td>VIC a</td>
</tr>
</tbody>
</table>

a Victoria  
b New South Wales  
c Queensland  
d Tasmania
A summary of the five identified themes and subthemes identified from interviews are displayed in Table 12.

**Table 12: Summary of themes identified from participant interviews**

<table>
<thead>
<tr>
<th>Theme</th>
<th>Definition</th>
<th>Subtheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Defining nutrition care as an important component of personal training</td>
<td>Most personal trainers perceived their role as supporting a holistic approach to lifestyle change which included a responsibility to educate clients about nutrition.</td>
<td>Nutrition and exercise were inseparable for clients to achieve their health and fitness goals.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Personal training was perceived as a holistic service.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The topic of nutrition was usually raised during the first client session.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The ability to provide nutrition care was considered a business opportunity.</td>
</tr>
<tr>
<td>2. Providing diverse nutrition care</td>
<td>The level of nutrition care provided ranged from minimal care to nutrition care that extended beyond the national dietary guidelines.</td>
<td>Clients were perceived to have variable expectations regarding the provision of nutrition care.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nutrition care provided was individualised.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>New dietary behaviours were often recommended based on dietary philosophies, which were usually not evidence-based.</td>
</tr>
<tr>
<td>3. Lacking an awareness and understanding of the scope of practice</td>
<td>A lack of certainty towards the scope of practice document was implied as many personal trainers could not draw conclusions or make comment on the current scope of practice, particularly with regard to nutrition.</td>
<td>Personal trainers had low awareness of the new scope of practice document.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The national dietary guidelines were not considered practical to use with clients.</td>
</tr>
<tr>
<td>4. Varying interpretations of the nutrition scope of practice</td>
<td>When presented with the nutrition-related statement within the Fitness Australia scope of practice, a diverse range of interpretations were offered.</td>
<td>The interpretation of ‘basic nutrition’ varied widely.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The boundary for ‘nutrition advice’ was considered to be the difference between suggesting dietary changes as opposed to prescriptive or directive statements.</td>
</tr>
</tbody>
</table>
5. Acknowledging gaps between nutrition knowledge and desired practice

Some personal trainers identified a gap between nutrition knowledge gained in formal education and the nutrition knowledge they felt was required in their role. Furthermore, a perceived lack of access to evidence-based nutrition information and resources was recognised as a limitation, but not a barrier to nutrition care.

Formal education provided in the Certificate III and Certificate IV was perceived as inadequate.

A lack of access to and awareness of, evidence-based nutrition resources was identified.

7.4.1 Defining nutrition as an important component of personal training

Many personal trainers perceived their role to include a holistic approach to lifestyle change and felt a responsibility to educate their clients about nutrition. Nutrition was perceived as an important component of personal training because of the direct link with client goals.

“They [clients] need to be made aware that nutrition is the bulk of it, and that basically, 80% of being healthy and fit is fuelling your body correctly....they think that if they turn up and train, that should suffice to then go and shove whatever they want in their mouth. So unfortunately, there is a little bit of interesting conversation around that point” Participant 11

Personal trainers also considered providing nutrition care as an essential service to attract clients and maintain businesses.

“I am studying an advanced diploma in nutritional medicine so that I can be qualified to start to be more hands on in terms of giving meal plans. I actively decided to do that because I recognise that not being able to do that as a weakness in my business.” Participant 1

Nutrition was considered such an important role that the topic was often discussed in the first client session. Some personal trainers included receptiveness to nutrition care as part of their initial client assessment and sometimes used client goals to broach the topic.
“When I'm doing an initial assessment I will ask what their diet is like, and if they are interested in any nutritional advice...it sometimes comes up as a result of their goal.”
Participant 14

7.4.2 Providing diverse nutrition care

All personal trainers reported that they provide nutrition care at an individualised level for their clients. This ranged from broad dietary messages through to specific macronutrient distributions for clients to achieve their goals.

“I make sure that all the clients are eating predominantly unprocessed foods, getting lots of veggies in for the nutrients, getting the balance of the protein and carbs and then just making sure that everything is balanced...based on what I believe they need” Participant 2

“It [nutrition care] really depends on the client themselves, and what their goals are, and where they are with their training. With some of them I lean towards lowering their carbs, others is increasing their carbs, depending on whether they are looking at muscle building or not we look at how much protein they should be having.” Participant 6

Personal trainers acknowledged that clients had varying expectations around nutrition care. Still, all personal trainers ended up providing nutrition care for each client at some point.

“It is a case by case basis. Some come with the expectation that you are going to give them a nutrition plan. Others just rock up and want to be trained and don’t appreciate that nutrition is a big part of it.” Participant 11

“I usually have to address it at some point because I don't want them relying on just doing exercise…” Participant 12
The level of evidence used to provide nutrition care varied. The majority of personal trainers lacked an evidence-based approach, and used personal opinion or broad nutrition beliefs such as organic foods or low-carbohydrate diets to inform their nutrition care.

“I’m not into low carbs particularly, I am for myself but for someone else I might say... maybe you could try cutting out wheat, or something like that, depending on their symptoms, like feeling tired,” Participant 5.

7.4.3 Lacking an awareness or understanding of the Fitness Australia Scope of Practice

Most personal trainers initially stated they were aware of the Fitness Australia scope of practice document, yet when probed further, appeared uncertain. A few admitted they could not remember the content (n=3), and some did not recognise the regulation even though it was released in the last year (n=6). Overall, the personal trainers in this study did not feel the scope of practice document impacted their own nutrition care practices similarly stating that,

“I haven't noticed a great deal of difference to what I do,” Participant 7.

Few personal trainers used the national dietary guidelines when providing nutrition care, and the majority argued that the national dietary guidelines were not useful or practical to use with clients, or that the guidelines were incorrect.

“I use them [the dietary guidelines] from time to time, but you know what? It’s too rigid,” Participant 3,

“The food pyramid and the guidelines are incorrect in that they promote too much cereals and grains and not enough fats...” Participant 14.
7.4.4 Varying interpretations of the nutrition scope of practice

Interpretation of the term “basic healthy eating advice” used within the scope of practice document varied. Most personal trainers interpreted the word ‘advice’ to mean not prescriptive, as in not written, directive or specifically measurable.

“It all has to be advice. You can’t say that someone has to do something, you can say “Would you consider doing this?” or “what would you think about changing this?” not telling them they need to or have to do something.” Participant 1

“I would never say to a client eat 50g of this, eat 30g of that and no detailed meal plans,” Participant 13.

Some personal trainers focused on the interpretation of the word ‘basic’ with interpretations that ranged from translation of the five food groups, to goal oriented, personalised macronutrient distributions. Basic nutrition was also interpreted as broad dietary philosophies,

“It [basic nutrition] is things like serves of fruits and vegetables, and macronutrient distribution for weight loss or muscle gain.” Participant 6.

“Basic healthy eating advice to me would be to tell someone to eat clean, eat organic, eat unprocessed,” Participant 5.

7.4.5 Acknowledging gaps between nutrition knowledge and desired practice

Personal trainers interviewed for this study felt their nutrition knowledge gained through Certificate III and IV in Fitness education was not enough to support their role as a personal trainer and all expressed a desire for further knowledge in nutrition.
“I think they [Cert 4 provider] brushed on one module that had very broad nutrition, pretty much just follow the Australian guidelines, but didn’t delve into it more than that. The information I have gained since then has been from other sources.” Participant 7

Personal trainers were aware of the need for evidence-based nutrition recommendations, but were unaware of how to access and evaluate available evidence. The Australian dietary guidelines were not considered enough and in the absence of other evidence-based information, personal trainers felt they were responsible to provide something else…

“I am not aware of any industry standard tool or anything that you can use…I wish that there was some way that we [personal trainers] could give clear, uncomplicated nutrition advice to clients, like I wish there was a way that we could educate them easily about how they could start to turn their nutrition around.” Participant 13

“…there is a gap in the market in as much as the scientific evidence-based advice isn't really available; so we [personal trainers] are giving out other stuff.” Participant 14

Finally, there was limited evidence for knowledge of up-to-date public health nutrition messages, highlighted by repeated references to the food and nutrition pyramid.

7.5 Discussion

This study explored personal trainers’ perceptions of providing nutrition care within the personal training environment. All personal trainers in this study perceived nutrition to be important for their clients and all personal trainers reported providing nutrition care. Previous studies have also shown that fitness professionals provide nutrition care\(^{30, 33}\), however this study further investigated personal trainers’ perceptions of their role including how nutrition care is provided and how regulation such as a scope of practice has influenced their personal training practices.
Personal trainers in this study perceived that the provision of nutrition care was within their professional role. Indeed, they are supported by their scope of practice to provide nutrition care in line with the national dietary guidelines. Previous research has highlighted the benefits of combined physical activity and nutrition care, which facilitates improvement in both dietary and physical activity behaviours in relation to the recommended guidelines. Combined care has been shown as a more effective strategy for changing body composition and for reduction in chronic disease risk than diet or physical activity alone. Personal trainers are in an ideal position to influence both dietary and physical activity behaviours of clients and results from this study suggest that they attempt to provide individualised nutrition care to meet the perceived needs and expectations of clients. As such, clients may benefit from personal trainers being supported to provide nutrition care. However, the provision of nutrition care by personal trainers often extends beyond the national dietary guidelines and has been identified as a major industry risk due to a perceived lack of nutrition knowledge and skill.

Personal trainers recognised a gap between their formal education and the level of nutrition care they felt should be provided to clients. One course covering basic nutrition principles is required to complete a personal training qualification (~12 hours). Still, personal trainers reported feeling underprepared for the nutrition aspect of their role and sought further nutrition information or education. National fitness regulation bodies, such as Fitness Australia, often promote nutrition courses for professional development. However, the quality of nutrition courses promoted varies and includes education beyond the recommended scope of practice for personal trainers (e.g. dietary prescription) and/or non-evidence-based approaches to nutrition (e.g. detox diets). Without appropriate nutrition education, personal
trainers are likely to provide nutrition care which may not support positive client health outcomes.

The promotion of poor quality professional development opportunities seems counterproductive to the fitness industry’s professional scope of practice and the desire for personal trainers to provide nutrition care for their clients. Additional nutrition education may improve access to credible nutrition information sources, which many personal trainers do not currently use. Further, by providing high quality nutrition education, national fitness regulation bodies would advocate for personal trainers to provide nutrition care within the recommended scope of practice, thereby lowering an identified industry risk. It is possible that further nutrition education may support greater confidence in providing nutrition care beyond the scope of practice. As such, targeted education on a personal trainer’s expected nutrition knowledge, the boundaries of their role, sourcing of credible information and the importance of a multi-disciplinary approach to client care should be prioritised. Given that personal trainers are likely to continue to provide nutrition care, the greatest emphasis should be placed on ensuring it is provided safely and effectively.

The national dietary guidelines were not used by the personal trainers interviewed in this study to guide the provision of nutrition care due to misinterpretation of the guidelines and a belief that the guidelines were inappropriate to use with clients. Instead, participants chose to provide nutrition care based on broad dietary philosophies such as “low carb”, “high fat”, or “organic”, as well as personal beliefs on macronutrient intake for body composition change. Many personal trainers in this study referred to nutrition guidelines, such as the food pyramid, which are no longer current. This may indicate that personal trainers do not have a clear understanding of the current national dietary guidelines and the underpinning evidence which evolves over time. Furthermore, personal training courses or information sources may
not be up-to-date. While the results of this study may not be generalisable due to the study’s qualitative approach and non-purposive sampling (resulting in an over representation of females), similar studies have shown that more than 75% of fitness professionals provide nutrition advice that differs to the national dietary guidelines. The provision of non-evidence-based nutrition care may lead to the provision of inappropriate or misleading advice, resulting in negative client health outcomes. Collectively, these results suggest a gap between the recommended scope of practice for personal trainers and actual practice of personal trainers with regard to nutrition care. This may be more concerning due to the potential respondent bias where personal trainers who have an interest in nutrition may be more likely to respond and are still unaware of their scope of practice and the available nutrition evidence. As such, future research should consider how to support personal trainers to provide safe and effective nutrition care by adapting evidence-based tools, such as the Australian Guide to Healthy Eating, for use in the personal training environment.

The impact of the Fitness Australia scope of practice document on nutrition care practices was minimal. Despite being introduced 12 months prior to this study, several trainers admitted they did not know the content or referred to a previous “code of ethics” which did not define a role for nutrition care in personal training. Previous research regarding codes of ethics and codes of practice within the fitness industry has shown poor awareness. Moreover, this study showed that instructions regarding nutrition care within the scope of practice were interpreted differently and the interpretations of ‘basic nutrition advice’ contrasted with actual nutrition care practices. This suggests a gap between personal trainers’ knowledge and understanding of the scope of practice, its applications, as well as current behaviours. While the scope of practice is freely available online, the promotion and explanation of the scope of practice appears limited. Furthermore, the lack of defined
standards for nutrition knowledge and skills may allow an open interpretation and flexible application. Refinement and reinforcement of the scope of practice document, development of clear competency standards and education for personal trainers may prove beneficial to identify and minimise ambiguity in interpretation of the roles and boundaries for personal trainers.

Personal trainers in this study perceived the provision of nutrition care as an important part of their role. However, many personal trainers reported providing non-evidence-based nutrition care beyond their recommended scope of practice and beyond their own definition of ‘basic nutrition advice’. To ensure personal trainers provide nutrition care in a safe and effective manner, clear nutrition competencies or standards should be developed and communicated during training along with greater enforcement of the scope of practice.
Chapter 8

Study 5 - An international comparison of nutrition education standards, occupational standards and scopes of practice for personal trainers

8.1 Abstract
8.2 Introduction
8.3 Methods
8.4 Results
8.5 Discussion

Reader’s Note: This chapter includes a co-authored paper. The bibliographic details of the co-authored paper, including all authors, are:


The candidate’s contribution to this publication involved:

- Study conception
- Study design
- Data collection (searching for policy documents and extracting data)
- Data analysis and categorisation of the data into a usable format
- Interpretation of the data
- Writing of the manuscript

(Signed):   (Date): 12/06/2017
Katelyn Barnes

(Countersigned):   (Date): 12/06/2017
Supervisor: Associate Professor Ben Desbrow

(Countersigned):   (Date): 12/06/2017
Supervisor: Dr Lauren Ball
An international comparison of nutrition education standards, occupational standards and scopes of practice for personal trainers

8.1 Abstract

Objective: To compare nutrition components of national education and occupational policies for personal trainers to ICREPs Global Standards.

Study Design: Cross-sectional content analysis of industry policy documents.

Methods: ICREPs affiliated national bodies were identified through ICREPs website review. Each national body website was searched for information relating to education and occupational standards and/or a scope of practice. Content analysis of each standard and/or scope of practice was undertaken to extract nutrition statements. Extracted statements were matched with nutrition components of the ICREPs Global Standards to result in a score based on the number of aligned ICREPs skills and knowledge criteria.

Results: Ten countries, with 16 organisations, were identified as being involved in the development of national education standards, occupational standards or scopes of practice for personal trainers. The education and occupational standards varied widely between countries and had minimal alignment with the ICREPs standards. Within countries there was malalignment of education standards with occupational standards and/or scopes of practice with regard to nutrition.

Conclusions: The expected role of personal trainers in providing nutrition care appeared to differ between countries. Within countries, industry expected competence for nutrition care was not guaranteed with education. Further work is required to ensure consistent standards
and assessment of nutrition care by personal trainers to support the provision of safe and effective nutrition care.

8.2 Introduction

Personal trainers are a large workforce of fitness professionals who are well placed to provide a combination of physical activity instruction and nutrition care. Personal trainers may positively influence dietary behaviours and subsequent health outcomes of clients through the provision of nutrition care. In this context, nutrition care refers to any practice conducted by a professional in an attempt to facilitate improvements in an individual’s dietary behaviours. Providing inappropriate nutrition care has been raised as an industry concern due to the risks of negative client health outcomes. A lack of competence of personal trainers to provide nutrition care is thought to contribute to this risk. Clearly, strategies that facilitate personal trainers developing nutrition knowledge and skills to provide safe and effective nutrition care should be explored.

Development of competence is usually supported through formal education and can be guided by competence models that align professional expectations of roles and responsibilities. In 2013, the International Confederation of Registers for Exercise Professionals (ICREPs) developed a competence model through a set of Global Standards for fitness professionals including personal trainers. The Global Standards provide guidance on the development or reform of national standards for fitness professionals, underpinned by skills and knowledge required for safe and effective practice. The Global Standards include two components on nutrition specifically for personal trainers: C3. Weight management and D3. The promotion of healthy eating and physical activity. However, it is unclear if the nutrition components of the Global Standards have been incorporated into national policies including education standards, scopes of practice or occupational standards for personal
trainers. Given that personal trainers are registered and trained nationally, incorporating Global Standards into national industry documents is important to develop and maintain consistent expectations and competence for personal trainers. This is especially pertinent as personal trainers have reciprocal practice across ICREPs associated countries \(^8^6\).

A review of policies for both nutrition education and practice guidelines of personal trainers would help to identify whether the Global Standards have been incorporated into the current regulatory environment in which personal trainers practise. A comparison of education policies may help to identify if personal trainers are supported to develop competence in nutrition care. In addition, a comparison of occupation specific policies may provide insight into appropriate boundaries for personal trainers with regard to nutrition care. The results of a policy review may help to inform and support future development and planning of national and international regulation for nutrition care provided by personal trainers. Therefore, this paper aims to (i) compare the nutrition components in formal education guidelines for personal trainers across ICREPs recognised countries; and (ii) compare nutrition components within formal occupational guidelines for personal trainers to the ICREPs competence model.

8.3 Methods

A scoping review identified all nutrition guidelines for personal trainers from countries who have a registration body that was recognised as a full member of ICREPs in 2016. Institutional ethical approval was not required for this study. Figure 4 outlines the four steps undertaken to complete this review. The review was conducted independently by researchers from an Australian university who are not involved in the national registration or competency standards for personal trainers.
Figure 4: Overview of the steps involved in the identification of all nutrition-related guidelines for personal trainers from ICREPs countries

8.3.1 Step 1 – Identification of ICREPs affiliates

ICREPs membership requires a national competence based registration system that receives support from industry. The national registration body must be a not-for-profit business and independent from all training providers. ICREPs members were identified through the ICREPs website. Further review of white and grey literature identified relevant regulatory bodies for fitness professionals within each ICREPs member country. White literature
included peer-reviewed journal articles identified through database searches using terms analogous with fitness professional, personal trainer, education, scope of practice, nutrition advice and registration. Grey literature included reports and websites from national government organisations, fitness industry bodies and fitness education providers. Websites not in English were translated where possible using Google Translate.

8.3.2 Step 2 - Identification of guidelines and standards

Organisation websites were searched for “guidelines” including education standards, occupational standards and/or scope of practice documents for personal trainers. Each guideline was categorised as educational (i.e. education standards) or occupational (i.e. occupation standards and/or scopes of practice). Education standards included accreditation forms or templates and curriculum guidelines from government or private bodies and excluded documents intended to guide student expectations (e.g. examination guides). Occupational standards encompassed documents that defined key skills and knowledge required to safely practise as a personal trainer. A scope of practice included documents that defined the roles and responsibilities of a personal trainer as well as the boundaries of their role.

8.3.3 Step 3 – Extraction of nutrition components

Extraction from education standards, occupational standards and scopes of practice included: (i) minimum level of education required to register; (ii) duration of education required; (iii) number of nutrition courses within vocational training and whether nutrition was a major focus (a course dedicated to nutrition) or a minor focus (a course that included nutrition among other topics); and (iv) a summary of expected nutrition. This information was defined as “detailed” or “broad”. “Detailed” guidance clearly defined expected nutrition skills and knowledge required whereas “broad” guidance outlined a task that could be completed but
did not define expected nutrition skills and knowledge for a task (e.g. “provide general nutrition guidance”). Data extraction and categorisation were completed by one researcher, and confirmed by one other researcher through discussion, until resolution.

8.3.4 Step 4 – Comparison of nutrition components

The ICREPs Global Standards, components C3 and D3, define the level of expected nutrition competence with 39 skill and 57 knowledge criteria. Content analysis was undertaken to match national guidance to a skill or knowledge criteria. To avoid bias in comparisons, minimal interpretation was used to match statements. Implicit knowledge or skills that may be expected, but were not written, were not included. A score was determined for each country based on the number of skill and knowledge points matched to the nutrition related standards. Industry stakeholders from ICREPs affiliated organisations were contacted where possible to clarify information within guidelines.

8.4 Results

ICREPs member countries and associated governing organisations

Table 13 outlines all ICREPs affiliated countries and the 16 organisations identified as being involved in guiding personal training development.
<table>
<thead>
<tr>
<th>Country</th>
<th>National registration body</th>
<th>Organisations involved in education standards development</th>
<th>Organisations involved in scope of practice development</th>
<th>Organisations involved in occupational standards development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Fitness Australia</td>
<td>Service Skills Australia</td>
<td>Same as registration body</td>
<td>None</td>
</tr>
<tr>
<td>Belgium</td>
<td>Belgium Register of Exercise Professionals (BREPS)</td>
<td>EuropeActive</td>
<td>EuropeActive / None</td>
<td>EuropeActive</td>
</tr>
<tr>
<td>Canada</td>
<td>National Fitness Leadership Alliance (NFLA)</td>
<td>None b</td>
<td>Provincial registration bodies a</td>
<td>None</td>
</tr>
<tr>
<td>Ireland</td>
<td>Register of Exercise Professionals for Ireland (REPS Ireland)</td>
<td>EuropeActive</td>
<td>EuropeActive / None</td>
<td>EuropeActive</td>
</tr>
<tr>
<td>New Zealand (NZ)</td>
<td>New Zealand Register of Exercise Professionals (NZREPs)</td>
<td>Same as registration body</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Poland</td>
<td>Register of Exercise Professionals for Poland (REPS Polska)</td>
<td>EuropeActive</td>
<td>EuropeActive / None</td>
<td>EuropeActive</td>
</tr>
<tr>
<td>South Africa (SA)</td>
<td>Register of Exercise Professionals South Africa (REPSSA)</td>
<td>South African Qualifications Authority AND registration body</td>
<td>Same as registration body</td>
<td>Same as registration body</td>
</tr>
<tr>
<td>United Arab Emirates (UAE)</td>
<td>Register of Exercise Professionals in the United Arab Emirates (REPSUAE)</td>
<td>Unknown</td>
<td>Same as registration body</td>
<td>Same as registration body</td>
</tr>
<tr>
<td>United Kingdom (UK)</td>
<td>United Kingdom Register of Exercise Professionals (UKREPs)</td>
<td>SkillsActive AND registration body</td>
<td>SkillsActive AND registration body</td>
<td>SkillsActive AND National Occupational Standards UK</td>
</tr>
<tr>
<td>United States of America (USA)</td>
<td>United States Register of Exercise Professionals (USREPs)</td>
<td>None b</td>
<td>None b, c</td>
<td>None</td>
</tr>
</tbody>
</table>
Provincial registration bodies with scopes of practice are available for 9/13 provinces and territories: Alberta and North Western territories, British Columbia and Yukon, Manitoba, New Brunswick, Nova Scotia, Ontario, Saskatchewan. Registration with a provincial body grants automatic registration with the NFLA. It is not possible to register with the NFLA without provincial registration. Exercise professionals in other provinces or territories may register with Alberta.

Each educational institution defines their own curriculum and Certified Personal Trainer (CPT) exam content. The National Commission for Certifying Agencies ensures the education matches the examination content.

There is no consistent scope of practice for personal trainers. Guidance for students on the role of a personal trainer differs between educational institutions. In addition, state laws restrict the role of a personal trainer in most states. A draft consultation outlining personal trainer definition is available, but is not expected to be published until 2018 (Coalition for the Registration of Exercise Professionals, 2016).

It was most common for the registration body to also provide occupational guidance (Australia, Canada, NZ, SA and the UAE). NZ’s registration body provided both educational and occupational guidance. In contrast, no national regulatory body was identified for the USA, with definitions of a personal trainer differing between educational institutions. In addition, legally appropriate practices for personal trainers are subject to state and federal laws. Canada had a similar provincial approach to regulation, in that ten provincial registers existed (for 13 provinces/territories), each with their own occupational guidance, and no education standards for personal training other than a competence examination.

Where education standards were authored by an organisation that was not the national registration body or occupational standards body (i.e. Australia, South Africa and USA), the national registration bodies reported that they review the curriculum received by each applicant to ensure the education is adequate to meet practice requirements. In contrast, educational institutions in NZ and the UAE are required to map their curricula to the occupational standards as set by the national registration body. If appropriate, the educational institutions were awarded accreditation by the registration body. A list of accredited courses is provided on the websites for REPS UAE and NZ REPS.

Belgium, Ireland and Poland shared a regional regulatory organisation (EuropeActive), which ensures similar educational and occupational guidance across all European countries. A
regional registration body, European Register for Exercise Professionals (EREPS) also exists. However, EREPS does not fit the criteria to be recognised by ICREPs and therefore is not discussed in this study. Belgium, Ireland and Poland have been grouped under the title “European countries” due to their similar regulation.

8.4.1 Education standards for nutrition and the ICREPs model

Table 14 outlines the education guidelines for personal trainers in ICREPs affiliated countries. To register, a personal trainer must demonstrate a minimum level of competency based training. Education involves a Certificate level course, equivalent to the European Qualification Framework level 4 (EQF4)\(^84\). This level of education prepares individuals to autonomously apply knowledge and skills in broad contexts within established boundaries\(^130\).
<table>
<thead>
<tr>
<th>Country</th>
<th>Minimum qualification to register (EQF equivalents)</th>
<th>Time to achieve minimum qualification</th>
<th>Defined classes (Yes/No)</th>
<th>Year of latest review</th>
<th>Minimum nutrition courses</th>
<th>Nutrition-related competencies addressed in education</th>
<th>Number of ICREPs nutrition competencies included in the national SOP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Major focus</td>
<td>Minor focus</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>D3</td>
<td>C3</td>
</tr>
<tr>
<td>Australia</td>
<td>EQF 4</td>
<td>4 weeks-24 months</td>
<td>Yes</td>
<td>2016</td>
<td>2</td>
<td>0</td>
<td>Detailed nutrition competencies around healthy eating and goal setting through selecting and applying the Australian Dietary Guidelines to healthy individuals without dietary restrictions. This includes knowledge of the food groups, nutrients, factors of a balanced diet, factors influencing metabolism, reading food labels, using and adapting the Australian Guide to Healthy Eating, keeping accurate client records, as well as the role of personal trainers and when to refer to dietitians.</td>
</tr>
<tr>
<td>Canada</td>
<td>EQF unknown</td>
<td>0 a.-12 months</td>
<td>No b</td>
<td>N/A</td>
<td>0</td>
<td>1 b</td>
<td>No national nutrition competencies for education.</td>
</tr>
</tbody>
</table>

Notes:

- EQF: European Qualifications Framework
- D3: Performance criteria
- C3: Knowledge criteria

a. Denotes a range of months

b. Denotes a range of courses or topics
Nutrition falls under ‘complementary practices’ b.

<table>
<thead>
<tr>
<th>Country</th>
<th>EQF</th>
<th>Length</th>
<th>Trained</th>
<th>Date</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>European countries</td>
<td>EQF 4</td>
<td>10 days-24 months</td>
<td>Yes</td>
<td>2014</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>(Belgium, Ireland &amp; Poland)</td>
<td></td>
<td>10 days-24 months</td>
<td>Yes</td>
<td>2014</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Detailed nutrition competencies include knowledge and understanding of nutrition principles such as energy balance (for health and for fat loss/muscle gain), the roles, appropriate intakes and source of dietary macro and micronutrients such as omega 3 fatty acids, cholesterol and vitamin B. Personal trainers should also be aware of local organisations for appropriate referrals.

<table>
<thead>
<tr>
<th>Country</th>
<th>EQF</th>
<th>Length</th>
<th>Trained</th>
<th>Date</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ</td>
<td>EQF 4</td>
<td>20 months</td>
<td>Yes c</td>
<td>2010 c</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Broad statements around the inability of any fitness professional to provide individualised dietary advice, except when in line with NZ dietary guidelines d.

<table>
<thead>
<tr>
<th>Country</th>
<th>EQF</th>
<th>Length</th>
<th>Trained</th>
<th>Date</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA</td>
<td>EQF 4</td>
<td>4 weeks – 13 weeks</td>
<td>Yes</td>
<td>2007</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Detailed nutrition competencies around providing nutrition care based on guidelines. Some performance criteria as well as knowledge and understanding points are included and cover the use of nutritional principles.

<table>
<thead>
<tr>
<th>Country</th>
<th>EQF</th>
<th>Length</th>
<th>Trained</th>
<th>Date</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
to optimise health, nutritional supplementation, practical examples of healthy eating programs and optimising nutrition requirements for exercise performance.

<table>
<thead>
<tr>
<th>Country</th>
<th>EQF</th>
<th>Duration</th>
<th>Education</th>
<th>Exam</th>
<th>Describe</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>UAE</td>
<td>unknown</td>
<td>Unknown</td>
<td>Unclear e</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>UK</td>
<td>EQF 4</td>
<td>1 week – 12 months</td>
<td>Unclear e</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>USA</td>
<td>EQF unknown f</td>
<td>0^a-24 months</td>
<td>No b</td>
<td>N/A</td>
<td>unknown</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

^a Personal trainers are required to sit an examination to gain their qualification. Education is recommended, but not required, to prepare for the examination.

^b Student examination guide indicates that nutrition forms part of a class dedicated to complementary practices.

^c NZ educational standards are being reviewed as of October 2016.

^d NZREPs 2010 accreditation forms used for this review did not specify knowledge or understanding of NZ dietary guidelines as a competency for any fitness course.

^e No education standards are publically available. All registrants submit their qualification details to the registration body and qualification details are verified against the National Occupational Standards. It is unclear how closely the qualifications must align with occupational standards. This is at the discretion of the registration body.
An individual must graduate from a course run by one of six education providers that form the Coalition for the Registration of Exercise Professionals (CREPs). This includes: American College of Sports Medicine, American College on Exercise, National Strength and Conditioning Association, Pilates Method Alliance, National Council on Strength and Fitness and the Cooper Institute.
Recommended time to complete education varied between countries with a typical length of approximately six months. The USA and Canada do not require education for personal trainers, but recommend up to two years for exam success. Six of the countries have education standards that include nutrition. For these countries, nutrition was either taught alongside other complementary practices or as a standalone course. Australia provided the greatest number of standalone nutrition courses.\(^95,96\)

Within many ICREPs affiliated countries, the guidelines for nutrition education were absent or superficial. No nutrition education standards were available for Canada, the UAE, the UK or the USA. Broad statements existed for NZ including learning about nutrition guidelines or principles and their application in general health and exercise. For example, NZ education standards state that personal trainers should ‘understand that they can only prescribe individual nutritional diets for clients in association with a registered nutritionist or dietitian’.\(^131\) However, there was no required knowledge or skill to complete this task safely or effectively such as knowledge of the current national dietary guidelines. In contrast, detailed nutrition competencies existed for Australia, European countries and SA.\(^95,96,132,133\) This included skills such as ‘Access and provide information regarding healthy eating, health and fitness to clients’ with underpinning knowledge such as an understanding of national dietary guidelines.

At the time of this review, no ICREPs member country had successfully included all nutrition components of the Global Standards into education for personal trainers. Australia and the European countries included appropriate referral practices within personal training education including role boundaries and identification of appropriate referrals.\(^95,96,132\) In contrast, SA provided education that may encourage personal trainers to extend their nutrition care beyond their own national scope of practice such as supplementation plans for performance.\(^133\) The
UAE, Canada, USA and UK did not have enough publicly available information on the education of personal trainers to comment on the nutrition knowledge and skills developed prior to registration.

8.4.2 Occupational guidance with regard to nutrition ICREPs

Table 15 describes national occupational guidance for fitness professionals. ICREPs affiliated countries should provide national occupational standards and a scope of practice. Canada and the USA have no national occupational standards and no national scope of practice. It is unclear if NZ has a national scope of practice as only a brief summary was identified.

Of the countries that have a national scope of practice (Australia, European countries, SA, UAE and UK), all address nutrition care. The majority of countries provide broad statements about the provision of nutrition care in line with national nutrition guidelines. These countries also recognise limitations of practice and/or referral to other health professionals when appropriate. However, only Australia and the UK acknowledge aspects of nutrition care considered beyond the role of a personal trainer such as individualised dietary prescription.

European countries, SA, the UAE and the UK possess national occupational standards for personal trainers. These include a description of nutrition knowledge and skills to underpin the roles of a personal trainer. For the European countries, SA and the UAE, the scope of practice and national occupational standards were considered the same document. For the UK, the scope of practice and national occupational standards were separate documents available from separate websites.

Countries with national occupational standards addressed at least one of the nutrition components in the ICREPs Global Standards. Typically, this was “D3. Promote healthy
eating and physical activity.” 28, 132, 135, 136, 138. Only the UAE occupational guidance included all ICREPs underpinning skills and knowledge to fulfil the standards safely and effectively 136. Other countries used broad statements for providing nutrition care and outlined variable skills and/or the requirement to do so safely and effectively. For example, the European countries defined 25 knowledge points and 8 skills across both ICREPs modules to provide safe and effective nutrition care 132. However, the SA occupational guidance stated only to ‘Provide generic nutrition information’ without defining the required skills or knowledge to do so 135.
Table 15: Summary of the occupational guidance for registered personal trainers in alphabetical order of ICREPs member country

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Existence of a national scope of practice (SOP) (Yes/No)</th>
<th>Existence of national occupational standards (NOS) (Yes/No)</th>
<th>Defined nutrition components within the SOP / NOS (Yes/No)</th>
<th>Defined competencies within the SOP / NOS (Yes/No)</th>
<th>Nutrition-related competencies within the SOP / NOS</th>
<th>Number of ICREPs where nutrition competencies are incorporated in the national SOP / NOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Broad nutrition competence around the provision of nutrition care in line with nationally supported nutrition guidelines. States that dietary prescription is beyond the role of a personal trainer and mentions referrals to other health professionals for optimal client health.</td>
<td>3 1 0 0</td>
</tr>
<tr>
<td>Canada</td>
<td>No (^a)</td>
<td>No</td>
<td>Some (^b)</td>
<td>No</td>
<td>N/A</td>
<td>N/A N/A N/A N/A</td>
</tr>
<tr>
<td>European countries (Belgium, Ireland &amp; Poland)</td>
<td>Yes</td>
<td>Yes (^c)</td>
<td>Yes</td>
<td>Yes</td>
<td>Detailed nutrition competencies include knowledge and understanding of nutrition principles such as energy balance (for health and for fat loss/muscle gain), the roles, appropriate intakes and source of dietary macro and micronutrients such as omega 3 fatty acids, cholesterol, vitamin B; awareness of local organisations for appropriate referrals.</td>
<td>1 7 8 17</td>
</tr>
</tbody>
</table>

\(a\) Some provinces or states have specific nutrition guidelines.

\(b\) Some provinces or states have specific nutrition guidelines.

\(c\) Some provinces or states have specific nutrition guidelines.
<table>
<thead>
<tr>
<th>New Zealand</th>
<th>Unclear</th>
<th>No</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Broad nutrition competence around provision of nutrition guidelines. States dietary prescription and supplements is outside the scope of practice for personal trainers.</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>UAE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Detailed nutrition competencies around the principles of nutrition and weight management include defined skills and knowledge in dietary information collection and analysis, goal setting, general healthy eating guidelines, the role and recommended intakes of macro and micro-nutrients and energy balance.</td>
<td>16</td>
<td>23</td>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td>UK</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>SOP: Broad nutrition competence around weight loss and principles of nutrition. States it is beyond the scope of practice to provide individualised meal plans. NOS: Detailed competencies around the application of nutrition principles and guidelines to active individuals including knowledge and skills in energy balance and equations, hydration, roles and common sources of nutrients, accurate record keeping and referrals to other health professionals.</td>
<td>0</td>
<td>5</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>US</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Provincial scope of practice is available for 9 of 13 recognised provinces and territories. Personal trainers in the 4 other provinces or territories may register with Alberta if they wish to be recognised for international practice (NFLA, 2016).

Of the 7 provincial scopes of practice, 4 address the provision of nutrition care.

The scope of practice and national occupational standards are the same document as described by the document title or by national representatives of industry.

No publicly available scope of practice identified.

This scope of practice has been built using the ICREPs competence model.

State law prohibits individualised nutrition care without a licence in 19 of the 51 states. Licensure for individualised nutrition care is restricted to dietitians and nutritionists. It is legal for personal trainers to provide individualised nutrition care in other states, though they are encouraged by their education providers and registration body not to prescribe meal plans (CNA, 2016).
8.5 Discussion

This study compared nutrition components of national education and occupational policies for personal trainers to ICREPs Global Standards. Across ICREPs affiliated countries, there was limited alignment of nutrition education standards, occupational standards and scopes of practice to the Global Standards. Furthermore, within countries there was misalignment of education standards with occupational standards and/or scopes of practice with regard to nutrition. Overall, the results suggest at a policy level, there are inconsistent and variable expectations for the nutrition knowledge and skills of personal trainers. Hence, the current policies intended to support personal trainers to provide nutrition care appear to hinder their ability to provide safe and effective nutrition care for their clients.

Variability existed in the educational and occupational guidance for personal trainers to provide nutrition care, both within and between countries. ICREPs introduced the Global Standards in 2013, yet limited adoption of these standards has occurred. For example, the education and occupational standards for personal trainers in the UK and Australia do not clearly reflect the ICREPs Global Standards for nutrition despite both countries reviewing all standards in 2016. In contrast, the REPUE was established in 2014 and has employed all nutrition components directly from the ICREPs Global Standards. Variability of education and practice guidelines also exists in the context of health professional education such as nursing and allied health. In health care, practice guidelines evolve to meet population health needs and education standards change to ensure competent performance. Given the potential for personal trainers to facilitate improvements in client health through diet and physical activity, it is likely that occupational guidance will continue to evolve as their role is further established. However, the current nutrition education provided to personal trainers does not match expected practice in many countries.
This is concerning due to the risk of adverse health outcomes associated with providing nutrition and exercise care for individuals with complex health needs. Therefore, personal training standards should focus on alignment of educational and occupational guidance. The ICREPs Global Standards could be used to guide alignment to ensure education supports development of competent practice and to ensure practice guidelines provide boundaries consistent with education.

Aligning policies with nutrition care components is likely to result in positive outcomes for the personal training workforce. Firstly, alignment of professional standards with nutrition education standards will better support competent and consistent nutrition care, which should benefit clients \(^{21, 85}\). Competence in nutrition should be demonstrated clearly through assessment, which should align with occupational standards and scopes of practice. Secondly, clear standards and scopes of practice can improve the reputation of the workforce by increasing transparency and accountability \(^{85}\). Transparency and accountability are important for personal trainers as the profession is self-regulated, unlike established health professions regulated with rigor by independent organisations \(^{17, 140}\). Transparency of the fitness industry could be increased by ensuring national standards are publicly available in one location.

Thirdly, alignment with the ICREPs Global Standards could enhance a sense of professional identity \(^{91, 85, 139}\). Previously, personal trainers and other health professionals have reported being uncertain of personal trainers’ role with regard to nutrition care \(^{91}\) (Chapter 7). Aligning national nutrition standards with the ICREPs Global Standards may clarify how the personal training workforce can be utilised in nutrition care and may improve collaboration with other health professions \(^{91}\).

Aligning national and international nutrition-related standards may also have some adverse effects. For instance, role standardisation has been linked to decreased professional autonomy
and decreased role satisfaction \cite{27, 85}. This may further impact workforce attrition, which is already high in personal training \cite{21, 27, 69, 141}. In addition, standardisation has been associated with decreased ability to meet clients’ needs \cite{27, 85}. Restricting the ability of personal trainers to provide nutrition care may discourage or disempower clients who are attempting healthy dietary changes (Chapter 6 and 7). Such consequences are particularly likely in personal training due to its evolution from a capitalistic or business focus where practice adaptations have occurred to meet client demand for nutrition care without concurrent governance \cite{21, 141}. Today it is still unclear if personal trainers are intended to function purely as a business or a para-health professional or both \cite{21, 27}. If personal trainers are to take a public health role in providing nutrition care, it is possible they can contribute to improved dietary behaviours of adults. However, stricter regulation is needed to ensure boundaries of practice align with education. Clear and consistent policies would help to achieve stricter regulation. The ICREPs Global Standards could be used to help align nutrition-related practice standards and education of personal trainers and to guide more appropriate assessment of competence in nutrition care. Further research is warranted to investigate the acceptability, feasibility and interpretation of the current ICREPs Global Standards by national level stakeholders in the fitness and health industries.

A profession is often defined by specific marketable knowledge or skills that have not been claimed by another profession \cite{139}. Some overlap occurs between the nutrition skills and knowledge of personal trainers and established health professions such as exercise scientists and dietitians \cite{35, 91}. Personal trainers can facilitate behaviour change and produce positive health outcomes \cite{142}. An opportunity exists for personal trainers to adopt a supporting role in optimising nutrition of individuals and therefore contributing to chronic disease prevention \cite{21, 22}. This is particularly true as the roles of health professionals are shifting away from
preventive activities and toward chronic disease management. However, lack of standardisation with regard to nutrition care may reduce this potential role for the personal training workforce. Furthermore, there is a lack of policy for education providers concerning assessment, which limits their ability to consistently demonstrate competence in nutrition care. These factors also limit the ability of regulatory bodies to clearly standardise nutrition education in personal training and subsequently the ability of personal trainers to provide safe and effective nutrition care. Regulatory bodies and education providers should work together to implement curricula that can clearly assess whether personal trainers can competently provide nutrition care that supports the development of healthy dietary behaviours of clients.

A limitation of this study was the difficulty in sourcing all standards and guidelines due to lack of public access and the involvement of multiple organisations with minimal reference to each other. Another limitation was that implicit expectations of nutrition knowledge and skills required by personal trainers were not captured in this study. However, it should be noted that education at EQF level 4 supports “…self-management within established guidelines” As such, all standards should be explicit so as to provide clear expectations of the personal training workforce. Furthermore, standards should be publicly available to improve awareness of the role and regulation of personal trainers both within and outside the fitness industry. While this review did not consider curricula or assessment of nutrition competence and cannot reflect the behaviours and context for all personal trainers, it does highlight the level of nutrition care that is expected from personal trainers from a policy standpoint. The variability of policies between education and professional practice raises doubt as to the competence of personal trainers to provide safe and effective nutrition care. A final limitation of this paper is that registration is voluntary for personal trainers. Only registered personal trainers are required to possess qualifications and abide by the scope of
practice and occupational standards. Mandatory national registration may improve the capacity to align standards of the personal training workforce by establishing a minimum entry-level competence to practice and a clear pathway to become a personal trainer.

This paper demonstrates that there are inconsistent standards across countries concerning the nutrition-related education standards, occupational standards and scopes of practice for personal training. Such inconsistencies obscure the role of personal trainers for those within and outside the fitness industry. Alignment of the standards (educational and occupational) and the scopes of practice may clarify expectations of personal trainers. Education of personal trainers must clearly assess competence to provide nutrition care in line with practice guidelines. The ICREPs Global Standards should be used as a starting point for all ICREPs associated countries.
Chapter 9

Discussion and Conclusions

9.1 Preface

This chapter considers the findings of the five investigations presented in Chapters 4 – 9 and relates the findings to the original aim of the thesis. An analysis of the problem is presented through the lens of each component of the PRECEDE framework to identify factors contributing to, and underpinning, the behavioural and environmental issues observed. The findings are then used to identify strategies to better support personal trainers to provide safe and effective nutrition care. While the PRECEDE model guides investigation for factors that influence behaviour, it does not predict or explain behaviour. As such, in making recommendations the theory of planned behaviour is used to justify potential avenues for change.

9.2 Overview of the findings

This thesis aimed to explore nutrition care by Australian personal trainers and the factors that contribute to personal trainers providing nutrition care beyond the recommended scope of practice. Table 16 summarises the aim and findings of each study in the thesis including the step of the PRECEDE PROCEED model that each study addresses.
<table>
<thead>
<tr>
<th>PRECEDE Framework</th>
<th>Study</th>
<th>Aim</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify the desired result.</td>
<td>Literature review; <em>Chapter 2.</em> Narrative review of literature.</td>
<td>To explore the potential of personal trainers to provide nutrition care.</td>
<td>Strategies are needed to support personal trainers to provide safe and effective nutrition care in line with the national guidelines.</td>
</tr>
<tr>
<td>Identify the issue.</td>
<td>Study 1; <em>Chapter 4.</em> Review of nutrition content on registered fitness business websites.</td>
<td>To investigate the intention of fitness businesses to promote the provision of nutrition care from personal trainers.</td>
<td>Most registered fitness businesses advertise nutrition care at risk of being or clearly beyond the scope of practice for registered personal trainers which creates an expectation that nutrition care beyond the scope of practice will be provided.</td>
</tr>
<tr>
<td>Examine the factors that influence behaviour lifestyle and responses to the environment.</td>
<td>Study 2; <em>Chapter 5.</em> Online questionnaire of clients and potential clients of personal trainers.</td>
<td>To explore the expectations of clients regarding the nutrition care provided by personal trainers.</td>
<td>Australian adults expect personal trainers to provide nutrition care. Expectations include nutrition care which extends beyond the recommended scope of practice for personal trainers. Australian adult expectations of personal trainers providing nutrition care were decreased by their level of education and self-perceived healthfulness.</td>
</tr>
<tr>
<td>Study 3; <em>Chapter 6.</em> Online survey of personal trainers practising in Australia.</td>
<td>To measure the self-perceived competence of Australian personal trainers in providing nutrition care.</td>
<td>Personal trainers were confident in their ability to provide nutrition care for all clients and reported positive attitudes toward providing nutrition care as part of their professional role. Self-perceived nutrition knowledge was positively correlated with self-perceived skills, professional experience and level of education. Personal trainers were less confident in their ability to access evidence-based nutrition</td>
<td></td>
</tr>
</tbody>
</table>
In-depth semi-structured interviews with 15 personal trainers. To explore personal trainers’ perceptions of their role and scope of practice with regard to providing nutrition care. All personal trainers provided nutrition care. Despite this, many were unaware or uncertain of the scope of practice for personal trainers and how this could influence the nutrition care they provided. Some personal trainers reported a gap between their formal nutrition education and what they perceive they need to maintain business.

| Identify best practice guidelines and prevalence of use. | Study 5; Chapter 8. Review of policies that relate to nutrition care in personal trainer education and practice. | To compare nutrition components of the ICREPS Global Standards for fitness professionals to educational and occupational guidelines for personal trainers in ICREPs recognised countries. | There is variable alignment of national educational and occupational guidelines with the ICREPs competence model. Within countries there is limited alignment between educational and occupational standards for personal trainers. This likely contributes to confusion around what personal trainers should know and be able to do. |
9.3 Analysis of the problem and implications

This section will discuss the results of the investigation presented in this thesis using the PRECEDE steps of the PRECEDE-PROCEED framework (See Figure 5, over page).

The desired outcome is the starting point of the framework, as indicated in Figure 5. The desired outcomes were identified in the literature review and research framework (Chapter 2, page 38; Chapter 3, page 43). In summary, the desired outcome is for clients to receive safe and effective nutrition care from a wide array of professionals including personal trainers. Stakeholders within and external to the fitness industry have previously identified the provision of nutrition care beyond the recommended scope of practice to be a significant risk due to the potential for negative client health outcomes. To ensure the nutrition care provided by personal trainers is safe and effective, it should be supported by competent, evidence-based practice and underpinned by a clear scope of practice. Safe and effective nutrition care for clients of personal trainers may help to reduce the risks of chronic disease in Australia.

The issues identified in this body of research were both behavioural and environmental. As indicated under Step 2 in Figure 5, behavioural issues involve observable or measurable actions. The behavioural issue identified by the literature review and confirmed by Studies 1-4 was that Australian personal trainers provide nutrition care that extends beyond their recommended scope of practice. Studies 1 and 4 further confirmed that Australian personal trainers intentionally provide nutrition care beyond the recommended scope of practice. As indicated under Step 2 in Figure 5, environmental issues involve legal, social or political influences that may affect behaviours. The environmental issue identified by the literature review and by Studies 2, 4, and 5 was that the regulatory, organisational and social environments in which personal trainers operate are unclear and therefore unable to provide
precise boundaries for personal trainers with regard to nutrition care. The interplay between the identified behavioural issue and environmental issue creates an ongoing barrier to achieving the desired outcome of safe and effective nutrition care from personal trainers. This situation ultimately has implications for personal trainers, clients and policy makers, warranting further exploration.

Figure 5: PRECEDE model as used in this thesis

9.3.1 Factors influencing personal trainer behaviours with regard to nutrition care

The research within this thesis confirms previous reports that personal trainers provide nutrition care beyond their recommended scope of practice (Studies 1, 2, 3 and 4) \(^{30}\). Furthermore, this investigation found that the scope of practice with regard to nutrition care provided is exceeded intentionally (Studies 1 and 4). To reduce the associated risks of
providing nutrition care beyond the scope of practice, it is important to understand what may influence personal trainer behaviour in order to identify potential avenues of change.

Factors that predispose personal trainers to provide nutrition care (as indicated under Step 3 in Figure 5), were first explored in Studies 2, 3 and 4. Personal trainers reported favourable attitudes toward providing nutrition care, high confidence in their ability to provide nutrition care and agreed that providing nutrition care was an effective use of their professional time (Study 3). These results are in contrast to health professionals who often report low confidence in their ability to provide nutrition care. Personal trainers believed that educating clients about nutrition was their ‘responsibility’ and justified this by reporting that an improvement in a client’s dietary behaviours would help to achieve client goals and ultimately assist in retaining that client in their business (Study 4). Overall, it appears that personal trainers perceive the provision of nutrition care results in exclusively positive outcomes for clients that subsequently supports business performance.

Personal trainers may also provide nutrition care due to client expectations of receiving nutrition care. Study 2 found that clients and potential clients expect personal trainers to provide nutrition care across a broad spectrum of topics, some of which extend beyond the recommended scope of practice for registered fitness professionals. These results align with a previous study where personal trainers reported that their clients request nutrition care from them. Still, it remains unclear if clients expect personal trainers to provide nutrition care because of the perception that personal trainers are the ‘gatekeepers of health and fitness’ or if the expectation arises because personal trainers are promoted as able to provide nutrition care, even beyond the recommended scope of practice (Study 1). Study 4 suggests that personal trainers attempt to meet client demands without regard for the scope of practice or the inherent risks associated with providing nutrition care. It would therefore appear that one
driver of personal trainers providing nutrition care is to meet client demand. In any case, expectations of nutrition care from fitness professionals and clients, combined with positive attitudes and beliefs for providing nutrition care, suggest that nutrition care forms part of a personal trainer’s professional identity. A professional identity that includes nutrition care supports the view that personal trainers will continue to provide nutrition care and may encourage personal trainers to provide nutrition care beyond their recommended scope of practice\textsuperscript{143}. Given the potential risks and benefits associated with personal trainers providing nutrition care, there is scope to support the development of personal trainer competence through clear and consistent assessment. A review of education provider learning outcomes and assessment practices for nutrition care in personal training is warranted.

Factors that reinforce personal trainers providing nutrition care beyond the scope of practice, (as indicated under Step 3 in Figure 5), were first explored in Study 4. Personal trainers expressed limited understanding of regulations for their role and limited regard for national dietary guidelines. These results are similar to previous studies that demonstrated low awareness of industry policies among fitness industry members\textsuperscript{87, 66}. None of the personal trainers interviewed could describe their role boundaries with regard to nutrition care. When asked about the national dietary guidelines and the Australian Guide to Healthy Eating (AGHE), many personal trainers confirmed not using the guidelines or AGHE, instead opting for personal opinion and anecdotal evidence to guide the nutrition care they provided. This may be due to the opportunity that personal trainers have to apply their own lived experience (personal and/or professional observations) as a template for clients to follow. Lack of awareness, or disregard for, professional regulation and evidence-based nutrition practice may provoke personal trainers to provide nutrition care that aligns with their own experience or personal views rather than national guidelines. Future efforts could be directed at
developing more appropriate nutrition tools for use in personal training that supports the provision of safe and effective nutrition care for clients.

Factors that enable personal trainers to provide nutrition care beyond the scope of practice (indicated under Step 3 in Figure 5) were explored in Studies 3, 4 and 5. Personal trainers reported that they were least confident in their nutrition knowledge, specifically in their ability to access up-to-date nutrition information (Study 3). Study 5 highlighted that the minimum nutrition education for personal trainers may not be specific enough to support safe and effective nutrition care, in line with the scope of practice for registered exercise professionals. This was further emphasised by personal trainers themselves who reported needing to pursue extra nutrition-related study to maintain their business position (Study 4). Unfortunately, nutrition-related courses available to personal trainers after graduation are of varied quality and can encourage personal trainers to provide nutrition care beyond their recommended scope of practice (See Chapter 2, pp. 22-23 and Appendix 2). Direct assessment or demonstration of nutrition competence by personal trainers does not appear to occur in Australia. Overall, low perceived access to evidence-based nutrition resources and services and proliferation of questionable nutrition education enables personal trainers to provide nutrition care that extends beyond their recommended scope of practice.

9.3.2 Factors influencing the environment in which personal trainers provide nutrition care

This thesis highlights fitness industry regulation and organisation structure as enabling personal trainers to provide nutrition care beyond the recommended scope of practice.

Regulation of personal trainers in Australia is not strict. While a scope of practice exists for Australian personal trainers, there are no clear standards to benchmark the specific
knowledge and skills required to complete tasks safely and effectively (Study 5). The current Australian scope of practice for registered exercise professionals provides broad guidance regarding roles and responsibilities. However, when personal trainers are presented with the nutrition components of the scope of practice documents, they report variable interpretations of the document that justify their practices (Study 4). As such, the Australian fitness industry’s expectations of personal trainers with regard to nutrition care are unclear and open to interpretation. Without a detailed description of the nutrition care that personal trainers should provide, it is unclear if the knowledge and skills developed with education adequately support safe and effective nutrition care (Study 5). Overall, ambiguous professional expectations enable personal trainers to provide nutrition care without enforceable boundaries.

Enforcement of the scope of practice is limited by client awareness, organisational structure and industry governance. First, a breach of the scope of practice must be recognised by a client and reported to the appropriate state consumer protection agency or Fitness Australia, depending on the nature of the concern. However, client expectations of personal trainers indicate poor awareness of, or agreement with, the personal trainer scope of practice (Study 2). As such, clients are not likely to identify or complain when a personal trainer provides nutrition care beyond the scope of practice. Secondly, the pathway to submit a complaint against a registered fitness professional is unclear. Complaints may be directed to state based consumer protection agencies or Fitness Australia, depending on the nature of the complaint and the applicable state regulations. Fitness Australia has a webpage to assist in directing complaints, however the processes and potential outcomes for different complaints remain unclear. Thirdly, while a reported breach of the scope of practice directed to Fitness Australia may result in personal trainer de-registration, Fitness Australia registration is
voluntary and not required to practise as a personal trainer. As such, there are limited penalties for breaching the scope of practice, which further enables personal trainers to provide nutrition care without boundaries.

Nutrition education courses endorsed by Fitness Australia for continuing education credits (CECs) are of variable quality (See Chapter 2, pp. 22-23 and Appendix 2). Some nutrition courses are reported to develop personal trainers to be competent in dietetics \(^{93, 94}\), which clearly extends beyond the Fitness Australia scope of practice and is not supported by other nutrition organisations \(^{34}\). Study 4 highlighted that many personal trainers choose to undertake further nutrition education in order to provide additional nutrition care for their clients as a strategy to maintain business. This finding is contradictory to previous studies in that it shows targeted professional development, unlike reports from fitness professionals in the UK \(^{97}\). The contradictory findings in this research may be due to a selection bias where personal trainers interested in nutrition were more likely to participate in Study 4. Still, the results highlight that availability and professional endorsement of such nutrition courses enable personal trainers to provide nutrition care beyond their recommended scope of practice. It is unclear if these nutrition courses gain endorsement from Fitness Australia because they are a popular choice among members or if Fitness Australia considers them as opportunities for their members to gain competence beyond the recommended scope of practice (See Chapter 2, pp. 28-29). The actual nutrition competence of personal trainers, demonstrated via assessment within the nutrition courses, is still unclear and there is potential for future investigation.

The interplay between environmental and behavioural issues may stem from a deep seated conflict around the purpose of fitness professionals. It is unclear if personal trainers can be considered health-related professionals, a business, or both, where the key point of difference
is regulation. A health professional is strictly regulated, requires a minimum of 4 years of training and operates within a finite scope of practice to provide or enable evidence-based care that meets the health needs of a patient \(^{140, 74, 80, 144}\). In contrast, personal training businesses are for-profit organisations that operate with fewer regulations than health professionals in private practice. Personal trainers adapt or extend their services to meet the wants or needs of customers because it will ultimately create a greater financial profit \(^{21, 27, 66, 87}\). This context was reflected in Studies 2 and 4, with clients reporting high expectations of nutrition care from personal trainers and personal trainers reporting that meeting the needs of clients with regard to nutrition care was necessary to maintain business. When personal trainers provide nutrition care beyond their recommended scope of practice, they could be considered to be undertaking the work of a health professional (Studies 2, 4 and 5). The literature review (Chapter 2, pp. 14) confirmed that while fitness professionals receive some support from the health care industry, personal trainers cannot be considered health professionals due to their level of education. Health professionals (such as nurses, dietitians and exercise physiologists) must undertake at least 4 years of tertiary education to develop a thorough understanding of metabolic processes and environmental constructs that underpin sound clinical reasoning \(^{15, 74, 80}\). Health professional programs are underpinned by rigorous assessment of professional competence prior to graduation \(^{13, 14, 74}\). In contrast, personal trainers undertake only short (~6 months) periods of education that have been shown to comprise variable topics and assessment activities (Study 5). As such, it appears the industry, public and workforce expectations of personal trainers are poorly aligned. These expectations do not reflect the Australian definition of health professionals and fail to support the delivery of nutrition care in line with the current scope of practice for registered fitness professionals. Study 5 discussed standardisation of nutrition care in personal training and the potential positive and negative impacts for the industry.
9.3.3 Summary

This research identified behavioural issues that underpin the reasons why Australian personal trainers provide nutrition care beyond the recommended scope of practice. To change current personal trainer behaviours and to facilitate safe and effective nutrition care that promotes the health and wellbeing of clients, fitness industry regulation and organisational structures need to change. The theory of planned behaviour has been selected to justify how each recommendation will support a change in personal trainer behaviour.

The theory of planned behaviour can be used to predict actual behaviours by considering intention to perform behaviours. The theory postulates that intention to perform behaviours is underpinned by three key beliefs: attitudes toward behaviour, normative beliefs and control beliefs. When attitudes toward performing behaviours are positive, it is likely that the intention to perform those behaviours is high. Stronger attitudes have a greater influence on intention and actual behaviour. Normative beliefs consider the perception that others approve or disapprove of behaviours and further consider how important approval or disapproval of others is to the individual that intends to perform the behaviours. Control beliefs relate to the presence of factors that may facilitate or hinder behaviours as well as the self-perceived ability to perform the behaviours. By considering this theory with each recommendation, it is possible to predict how recommendations will influence the behaviour of personal trainers. The recommendations aim to reduce industry risk by decreasing the intention of personal trainers to provide nutrition care beyond the recommended scope of practice. Figure 6 illustrates the theory of planned behaviour.
9.4 Recommendations

The lack of clear, enforceable role boundaries for personal trainers providing nutrition care is a key regulatory weakness that underpins both the environmental and behavioural issues enabling personal trainers to provide nutrition care beyond their recommended scope of practice. Therefore, the following recommendations have been developed based on the findings of Studies 2-5 to help modulate the environment in which personal trainers practise in Australia. Overall, this should positively influence personal trainer behaviours to better align with their ability to provide nutrition care and to improve the health behaviours of Australians.

**Recommendation 1:** Clear role statements for nutrition care in personal training need to be developed, with underpinning knowledge and skills required to complete the roles safely and effectively. Role statements and competencies should adequately reflect the level of education expected of personal trainers. Minimum required nutrition knowledge and skills for the Certificate IV in Fitness should be established first, before considering the establishment of additional nutrition knowledge and skills available through Diploma or Bachelor level education. The role statements and competencies should be developed through an iterative
process that includes and represents the interests of major stakeholders including: personal trainers, health professionals (e.g. dietitians and nutritionists), education professionals (e.g. VET administration and educators), the Australian public (e.g. consumer representative groups), as well as fitness employers (e.g. franchise gyms and small personal training business), and must be aligned with the Australian Qualifications Framework.

Recommendation 1 is an avenue to change the behaviour of personal trainers through modulation of perceived behavioural control and actual behavioural control. Involvement of key stakeholders is important to ensure different viewpoints are considered when defining the roles and responsibilities of personal trainers. The acceptability, feasibility and interpretation of draft and final competencies, as well as role statements, should be tested among the key stakeholders. Involvement of key stakeholders in developing clear role statements and competencies will help to improve transparency of the fitness industry’s self-regulation, which was highlighted in Study 5 as being poor.

**Recommendation 2:** The scope of practice for registered fitness professionals should be promoted and advocated and its use should be monitored by authorities within the fitness industry. Likewise, the scope of practice should be clearly communicated to individuals and communities within and outside the fitness industry (i.e. fitness professionals, fitness employers, health professionals and the Australian public). The industry bodies, in this case, Fitness Australia, should seek feedback to ensure that stakeholders have a clear understanding of the role of personal trainers in providing nutrition care.

This recommendation is an avenue to change the behaviour of personal trainers through modulation of normative beliefs. The expectation to provide nutrition care beyond the scope of practice arises from clients (Study 2), other personal trainers (Study 4) and from personal trainer businesses (Study 1). Promotion of the endorsed roles of personal trainers
with regard to nutrition care may help to align expectations of personal trainers with this scope of practice. Widespread awareness and better understanding of the scope of practice may result in more appropriate advertising of nutrition services beyond the scope of practice (Study 1) and subsequently, may help to align stakeholders’ expectations of personal trainers. Effective promotion of the scope of practice document may also help to increase transparency of the fitness industry, which could subsequently improve the reputation of industry members and increase public trust.

**Recommendation 3:** Authorities in the fitness industry (e.g. Fitness Australia and fitness industry employers) should implement consequences for personal trainers who provide dangerous or misleading nutrition care. Clear pathways for reporting dangerous or misleading nutrition care, including providing nutrition care beyond the recommended scope of practice, should be established. To improve clarity of current pathways, the complaints website should include a summary of the types of complaints that should be directed to consumer protection agencies and a summary of the types of complaints that should be directed to Fitness Australia. This information could also include possible outcomes that may result from initiating a complaints process with either organisation.

This recommendation is an avenue to change through modulation of the behavioural beliefs of personal trainers. A negative outcome associated with providing nutrition care beyond the recommended scope of practice reinforces the inappropriateness of a behaviour. To support the creation of negative outcome belief, reporting of dangerous or misleading nutrition care should be encouraged through clear pathways. Without clear pathways, the risk of penalty will likely be insufficient to overcome the current positive beliefs associated with providing nutrition care. Given personal trainers’ motivations to provide nutrition care beyond the scope of practice, it is possible that penalising breaches may have unintentional
effects such as being a deterrent to registration or employment instead of a deterrent to breaching the scope of practice.

**Recommendation 4:** Organisations and individuals within and outside the fitness industry should advocate for mandatory registration to practise as a personal trainer.

Recommendations 3 and 4 together provide enforceable boundaries for personal trainers when providing nutrition care. Enforceable boundaries provide an avenue to change the behaviour of personal trainers through modulation of behavioural and control beliefs. Enforceable boundaries will carry greater risk and are therefore likely to deter personal trainers from providing nutrition care beyond the recommended scope of practice. Enforceable boundaries may also reduce the subjective norm of advertising nutrition care beyond the recommended scope of practice (Study 1). In turn, this may help to align fitness business and public expectations of personal trainers with the scope of practice.

**Recommendation 5:** Nutrition education for personal trainers should clearly reflect and support industry related professional roles and competency standards. Registration bodies, such as Fitness Australia, should seek to endorse nutrition-related professional development courses that align with their scope of practice. This may be facilitated through seeking guidance from reputable nutrition organisations such as the Nutrition Society of Australia, the Dietitians Association of Australia and/or the Association for Nutrition.

This recommendation is an avenue to change through modulation of personal trainer behavioural beliefs. Reducing access to non-evidence-based nutrition information may lead to a decrease in the provision of dangerous or misleading nutrition care. Furthermore, this recommendation is an avenue to change through modulation of perceived behavioural control of personal trainers. Accredited nutrition education may encourage behavioural
beliefs of positive outcomes when providing evidence-based nutrition care and negative outcomes for providing care beyond what they have been deemed competent to provide. Furthermore, education can change an individual’s perception of their ability to perform behaviours. If personal trainers are taught to achieve approved competencies in nutrition care, they should perceive the provision of such nutrition care as easier than providing nutrition care that has not been taught (i.e. misleading or dangerous nutrition care). Recommendation 5 will likely increase personal trainers’ access to evidence-based nutrition education that is in line with the recommended scope of practice. Improved access to nutrition education should positively impact personal trainers’ nutrition-related knowledge and skills, which should translate to providing safe and effective nutrition care.

It was highlighted in Study 3 that increased confidence in nutrition knowledge may increase confidence in the ability to provide nutrition care beyond the scope of practice. As such, nutrition education of personal trainers should include competencies related to the critical appraisal of nutrition evidence. In a best case scenario, an increase in evidence-based nutrition education and critical appraisal skills may allow for increased ability of personal trainers to acknowledge what they do not know and how that may impact their nutrition skills. The alternative may be an increase in confidence and a greater likelihood of breaching the scope of practice with regard to nutrition care (i.e. Dunning-Kruger effect).

**Recommendation 6:** Individuals and organisations within and outside the fitness industry should advocate for collaboration between fitness professionals, health professionals and researchers to explore how personal trainers may best support Australian individuals to improve dietary and physical activity behaviours. This should be supported by joint position statements between Fitness Australia and nutrition organisations (e.g. the Dietitians Association of Australia, Sports Dietitians Australia and Nutrition Australia).
Within this recommendation, further research is needed to consider the effectiveness of personal trainers in providing nutrition care and to clarify the ideal role for personal trainers in providing nutrition care. An understanding of the impact on client health outcomes, the cost-effectiveness of personal trainers providing nutrition care and perceived appropriateness of personal trainers providing nutrition care among key stakeholders is still needed.

Recommendation 6 is an avenue to change the behaviour of personal trainers through modulation of normative beliefs and control beliefs. Evidence produced by research may provide encouragement or deterrents for personal trainers to provide nutrition care. Furthermore, working with other health professionals may increase the mutual understanding and appreciation of each other’s roles in facilitating improvements in the health and wellbeing of Australian individuals. Mutual understanding of the roles of each professional may result in more referrals, greater reputation of fitness industry workers and improved health outcomes for Australian individuals.

To assist in the understanding of roles, joint position statements should be drafted between fitness industry bodies and nutrition organisations (e.g. Dietitians Association of Australia, Sports Dietitians of Australia and Nutrition Australia). Joint position statements may help to delineate roles and specify how personal trainers and nutrition professionals can work together. Previous successful joint publications and implementation of policies, such as the “Adult Pre-Exercise Screening System” (created in collaboration with Exercise and Sport Science Australia and Sports Medicine Australia)\textsuperscript{146,147}, show that Fitness Australia has previously collaborated with stakeholders outside of the fitness industry to promote client safety.
References


121. Burke L. Communicating sports science in the age of the twittersphere. *International Journal of Sport and Exercise Metabolism*. 2017;26(1-5).


## Appendices

### Appendix 1: Overview of Fitness and Nutrition Education Courses, Graduated Roles and Competencies

<table>
<thead>
<tr>
<th>Level</th>
<th>Certificate 3 in Fitness</th>
<th>Certificate 4 in Fitness</th>
<th>Diploma of Fitness</th>
<th>Bachelor of Science/Physiology or Human Movement courses (ESSA eligible courses)</th>
<th>Bachelor of Nutrition and Dietetics or equivalent postgraduate degree (DAA eligible courses)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommended Duration</strong></td>
<td>3 to 6 months&lt;sup&gt;61&lt;/sup&gt;</td>
<td>6 months to 1 year&lt;sup&gt;62&lt;/sup&gt;</td>
<td>3-2 years&lt;sup&gt;63&lt;/sup&gt;</td>
<td>3-4 years&lt;sup&gt;26&lt;/sup&gt;</td>
<td>3-4 years&lt;sup&gt;24&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Entry Requirements</strong></td>
<td>None</td>
<td>Certificate 3 in Fitness</td>
<td>Certificate 3 and 4 in Fitness</td>
<td>High school certificate with OP 1-7 (or equivalent.)</td>
<td>High school certificate with OP 1-7 (or equivalent.)</td>
</tr>
<tr>
<td><strong>Description of Graduated Role</strong></td>
<td>The Exercise Instructor would be able to&lt;sup&gt;40,61&lt;/sup&gt;:</td>
<td>In addition to the roles of an Exercise Instructor, a Personal Trainer must be able to&lt;sup&gt;40,62&lt;/sup&gt;:</td>
<td>In addition to the roles of an Exercise Instructor, a Specialist Trainer is able to&lt;sup&gt;40,63&lt;/sup&gt;:</td>
<td>An exercise scientist/physiologist is able to&lt;sup&gt;26&lt;/sup&gt;:</td>
<td>A dietitian is able to&lt;sup&gt;24&lt;/sup&gt;:</td>
</tr>
<tr>
<td></td>
<td>- Work as part of a team in a fitness centre, gym, or private business.</td>
<td>- Work independently or as part of a team in a fitness centre, gym, or private business.</td>
<td>- Work in a variety of environments e.g. Hospital, fitness centre, private home, portable gym, individually or as part of a team.</td>
<td>- Work individually or as part of a multidisciplinary team in a variety of environments e.g. Hospital, private clinics, rehabilitation centres, policy and/or government, research and/or educational institutes, gyms, fitness centres.</td>
<td>- Promote exercise and physical activity in line with the national dietary guidelines.</td>
</tr>
<tr>
<td></td>
<td>- Conduct an initial client induction including.</td>
<td>- Develop, conduct and evaluate long term and periodised fitness plans.</td>
<td>- Deliver and adjust exercise plans for 'at risk' populations in collaboration with and under the guidance and supervision of allied health professionals e.g. Physiotherapists, Exercise Physiologists.</td>
<td>- Design and deliver exercise programs and assessments for apparently healthy clients, and</td>
<td>- Liaise with other health professionals to ensure positive client outcomes.</td>
</tr>
<tr>
<td></td>
<td>- Basic screening, fitness appraisal, program development and exercise instruction.</td>
<td>- Evaluate and analyse the performance of individual clients or groups in a variety of fitness settings.</td>
<td>- Deliver higher level fitness training, sports conditioning, sports training.</td>
<td>- Assess, design diet plans and implement strategies to improve dietary behaviours and/or nutritional status of</td>
<td>- Liaise with other health professionals to ensure positive client outcomes.</td>
</tr>
<tr>
<td></td>
<td>- Design individualised training programs within the context of a long term plan.</td>
<td>- Provide advice on a range of areas related to health and fitness.</td>
<td>- Manage GP referrals requesting admission into and</td>
<td>- Assess, design diet plans and implement strategies to improve dietary behaviours and/or nutritional status of</td>
<td>- Assess, design diet plans and implement strategies to improve dietary behaviours and/or nutritional status of</td>
</tr>
</tbody>
</table>
instructional strategies in a range of exercise modalities.

- Regularly appraise client's fitness and modify their program accordingly.

outdoor fitness settings.

- Supervise and train other fitness staff.

supervision with specific approved programs.

- Liaise with a range of other professionals from both the health and fitness industries and engage in project management and health promotional activities.

- Carry out the functions of middle management including staff management and training.

clients with pathology or injury that have been diagnosed by an appropriately qualified health professional.

- Design and deliver sports and performance related exercise programs.

- Evaluate and analyse client progress and performance. Update client plan, and/or communicate progress to the multidisciplinary team

An Exercise Scientist is bound by legal regulations to

- Practice within the scope of exercise science training, and recognise the need to refer a client to other related professionals.

- Apply evidence-based practice, including the ability to compile, critically evaluate, and communicate the scientific rationale for their professional decision making and service delivery.

A dietitian is bound by legal requirements to

- Recognise the limits of competence, referring to the most appropriate provider if necessary

- Practice with current evidence-based practice

- Continually update and extend professional knowledge and skills through such activities as attending professional development or seeking a mentor
<table>
<thead>
<tr>
<th>Nutrition Competency</th>
<th>SISFFIT005 – Provide healthy eating information 83.</th>
<th>SISFFIT026 - Support healthy eating through the Eat for Health Program 84.</th>
<th>None Included 85.</th>
</tr>
</thead>
<tbody>
<tr>
<td>This course enables graduates to:</td>
<td>This course enables graduates to:</td>
<td></td>
<td>Graduates will have the knowledge to provide general advice on nutrition to apparently healthy clients.</td>
</tr>
<tr>
<td>• Provide healthy eating information.</td>
<td>• Identify client needs within the Eat for Health Program.</td>
<td>• Develop client profiles of food choices and eating patterns.</td>
<td>This includes description of nutrients and their role in health and wellbeing; description and aetiology of obesity and metabolic consequences, address common questions about nutrition for performance, undertake basic dietary analysis and discuss implications, description of the evidence for nutritional supplements, evaluation of risks for health of common diets, and the ability to recognise limitations of own nutrition knowledge or skill and understand appropriate referral pathways 86.</td>
</tr>
<tr>
<td>• Support positive attitudes to eating and body composition.</td>
<td>• Provide eating pattern and health status information.</td>
<td>• Influence healthier eating patterns.</td>
<td>Graduates will have demonstrated competence in 55 distinct nutrition and diet related standards that support safe and effective practice for nutrition therapy. As such, graduates are eligible to register with the Dietetics Association of Australia (DAA). Dietitians can prescribe dietary treatment and/or plans for groups and/or individuals of all ages, and for a range of medical conditions, both acute and chronic 87.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AQF description of graduate attributes 58</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
<th>Level 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduates at this level will apply knowledge and skills to demonstrate autonomy and judgement and to take limited responsibility in known and stable contexts within established parameters</td>
<td>Graduates at this level will apply knowledge and skills to demonstrate autonomy, judgement and limited responsibility in known or changing contexts and within established parameters</td>
<td>Graduates at this level will apply knowledge and skills to demonstrate autonomy, judgement and defined responsibility in known or changing contexts and within broad but established parameters</td>
<td>Graduates at this level will apply knowledge and skills to demonstrate autonomy, well-developed judgement and responsibility in contexts that require self-directed work and learning and within broad parameters to provide specialist advice and functions.</td>
<td>Graduates at this level will apply developed knowledge of nutritional science, health and disease, food and food preparation methods to tailor recommendations to improve health of individuals, groups and/or populations.</td>
</tr>
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</table>

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<tr>
<th>Level 7</th>
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<tbody>
<tr>
<td>Graduates at this level will apply knowledge and skills to demonstrate autonomy, well-developed judgement and responsibility in contexts that require self-directed work and learning and within broad parameters to provide specialist advice and functions.</td>
</tr>
<tr>
<td>Ability to diagnose?</td>
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<tr>
<td>----------------------</td>
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<tr>
<td>Ability to treat illness or injury?</td>
</tr>
</tbody>
</table>
Appendix 2: Summary of nutrition-related CEC courses listed with Fitness Australia in 2014

Courses are classified as within scope of practice \(^a\), at risk of being beyond scope of practice \(^b\), beyond scope of practice \(^c\). Information obtained from Fitness Australia website, list of CECs in 2014 and 2017.

<table>
<thead>
<tr>
<th>Year of review</th>
<th>Course</th>
<th>Provider</th>
<th>Rating</th>
<th>Overview of course content</th>
<th>CECs Length</th>
<th>Run by</th>
<th>Accredited by</th>
<th>Mode of Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>Eating Green: Meeting nutritional Needs on a vegetarian diet</td>
<td>Australian Fitness Network</td>
<td>Within scope (^a)</td>
<td>Provides information on vegetarian diets and how they can closely follow the Australian Dietary Guidelines. It supplies fitness professionals with information about vegetarian diets so that they can give nutritional advice to people who do choose a vegetarian diet. The course includes a conversation about the use of dietary supplements for vegetarians. Providing advice on dietary supplementation may be considered beyond the role of fitness professionals. The outcomes of this part of the course are unclear.</td>
<td>5</td>
<td>5 hours</td>
<td>APD</td>
<td>Fitness Australia; REPs NZ</td>
</tr>
<tr>
<td>2014</td>
<td>Tools for making nutrition your business</td>
<td>eLearning Space</td>
<td>Within scope (^a)</td>
<td>Provides information on the Australian Healthy Eating Guidelines, as well as the scope of fitness professionals. The course provides a model for implementing nutrition into a personal training business.</td>
<td>5</td>
<td>5 hours</td>
<td>Not stated</td>
<td>Fitness Australia</td>
</tr>
<tr>
<td>2014</td>
<td>Certificate in fitness and nutrition for children</td>
<td>FIA Fitnation</td>
<td>Within scope (^a)</td>
<td>Provides information about nutrition, personal training and group exercise for children in order to be able to promote healthy eating and exercise practices in children.</td>
<td>15</td>
<td>50 hours</td>
<td>Not stated</td>
<td>Fitness Australia; Physical Activity Australia</td>
</tr>
<tr>
<td>Year</td>
<td>Course Title</td>
<td>Provider</td>
<td>At risk of being beyond scope</td>
<td>Within scope</td>
<td>Description</td>
<td>Duration</td>
<td>Instructor</td>
<td>Affiliation</td>
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</tr>
<tr>
<td>2014</td>
<td>Nutrition and weight management</td>
<td>FIA Fitnation</td>
<td>Within scope</td>
<td><strong>Within scope</strong></td>
<td>Provides information on fat loss and the factors involved in fat distribution and gain. The course also gives an understanding of the psychological and social influences on food intake, as well national trends in weight gain. Uses national dietary guidelines to direct nutrition</td>
<td>4</td>
<td>3-8 hours</td>
<td>Not stated</td>
</tr>
<tr>
<td>2014</td>
<td>Dietitians guide to weight loss nutrition</td>
<td>Nutrition Training Australia</td>
<td>Within scope</td>
<td><strong>Within scope</strong></td>
<td>Provides information that guides fitness professionals on how to use the Australian Dietary Guidelines as a weight loss educational tool. This program also acknowledges that fitness professionals need to educate their clients with the Australian Dietary Guidelines only</td>
<td>7</td>
<td>8.5 hours</td>
<td>APD</td>
</tr>
<tr>
<td>2014</td>
<td>Active Nutrition</td>
<td>Sports Dietitian Australia Ltd</td>
<td>Within scope</td>
<td><strong>Within scope</strong></td>
<td>Provides basic healthy eating advice and information on pre, during and post exercise nutrition timing. It also explains how to provide dietary advice within one's scope of practice</td>
<td>8</td>
<td>1 day</td>
<td>Sport dietitians (APD)</td>
</tr>
<tr>
<td>2014</td>
<td>Beyond eating for two: Nutrition for pre-conception and pregnancy</td>
<td>Australian Fitness Network</td>
<td>At risk of being beyond scope</td>
<td><strong>Beyond scope</strong></td>
<td>This course teaches fitness professionals about the importance of nutrition, weight gain and blood glucose in preconception and pregnancy. Nutrition and exercise specifically for pregnancy are considered beyond to scope of practice for fitness professionals. Intended outcomes of this course are unclear. However, the course is taught by an APD, as such it may fall within the scope of practice for registered fitness professionals.</td>
<td>5</td>
<td>5 hours</td>
<td>APD (also a PhD doctorate)</td>
</tr>
<tr>
<td>Year</td>
<td>Course Title</td>
<td>Provider</td>
<td>Description</td>
<td>Credit Hours</td>
<td>Qualification</td>
<td>Location</td>
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<tr>
<td>2014</td>
<td>Effective nutrition coaching for personal trainers</td>
<td>Australian Fitness Network</td>
<td>Provides information on nutrition coaching for improved performance. Outcomes of the course are listed as nutritional status assessment. Detailed nutritional assessments (as indicated by sports performance being the focus and not nutritional guidelines) is considered beyond the scope of practice for fitness professionals. Intended outcomes of this course are unclear. However, the course is taught by an APD, as such it may fall within the scope of practice for registered fitness professionals.</td>
<td>5</td>
<td>PhD doctorate</td>
<td>Online</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>Everyday nutrition for everybody</td>
<td>Australian Fitness Network</td>
<td>This course provides information for fitness professionals to help their clients make positive dietary changes. However it includes information beyond the dietary guidelines in regards to weight loss and fat intake, which could be considered beyond the scope of practice for fitness professionals. Intended outcomes of this course are unclear. However, the course is taught by an APD, as such it may fall within the scope of practice for registered fitness professionals.</td>
<td>5</td>
<td>PhD doctorate</td>
<td>Online</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>Course Description</td>
<td>Provider</td>
<td>At risk of being beyond scope</td>
<td>Details</td>
<td></td>
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<tr>
<td>2014</td>
<td>Nutrition strategies for strength and size</td>
<td>Australian Fitness Network</td>
<td>This education package informs fitness professionals about evidence-based knowledge on supplements, recent research on hypertrophy, and the current nutritional guidelines for increasing muscle mass. It is unclear what guidelines were used to educate on increasing muscle mass. It is unlikely those guidelines were national nutrition guidelines. Furthermore, providing advice on supplement plans is considered beyond the scope of practice for fitness professionals. However, Intended outcomes of this course are unclear. The course is taught by an APD; as such it may fall within the scope of practice for registered fitness professionals.</td>
<td>5 hours PhD doctorate Fitness Australia; REPs NZ Online</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2014</td>
<td>E-learning - nutrition for athletes</td>
<td>Australian Strength &amp; Conditioning Association</td>
<td>Provides information on sports specific nutrition, and planning intake for athletes. Providing sports specific nutrition advice or athletic nutrition care is considered beyond the scope of practice for fitness professionals. However, the learning outcomes of the course are unclear.</td>
<td>2 hours PhD doctorate Fitness Australia Online</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>Childhood nutrition</td>
<td>Cadence Health</td>
<td>Provides information on the nutritional needs of children, as well as advice on how to deal with children with obesity. Working with children is beyond the scope of practice for most fitness professionals, working with obese clients is considered beyond the scope of practice for fitness professionals. Still the content and learning outcomes of this course are unclear.</td>
<td>8 hours Not stated Online Physical Activity Australia; REPs; Fitness Australia</td>
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<tr>
<td>Year</td>
<td>Course Description</td>
<td>Provider</td>
<td>Scope</td>
<td>Hours</td>
<td>Provider Details</td>
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<tr>
<td>2014</td>
<td>Certificate in exercise nutrition</td>
<td>FIA Fitnation</td>
<td>At risk of being beyond scope</td>
<td>15 50 hours</td>
<td>Fitness Australia; Physical Activity Australia</td>
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<td></td>
<td>Provides information about nutrition specifically for weight loss, enhanced sport performance and promoting energy balance. It also teaches methods for measuring energy intake. Nutrition for sports performance is considered beyond the scope of practice for fitness professionals. The outcomes of the course are unclear.</td>
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<tr>
<td>2014</td>
<td>Healthy eating - managing good nutrition</td>
<td>Genesis Ed</td>
<td>At risk of being beyond scope</td>
<td>1 1 hour</td>
<td>APD</td>
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<td></td>
<td>This course outlines the nutritional needs of lactating and/or pregnant women, providing also strategies to reduce the risk of infants developing food allergies. This course also informs about foods that can affect cholesterol levels, and the dietary requirements of the elderly. Providing nutrition care for specific populations such as pregnant or lactating women or elderly people is considered beyond the scope of practice for fitness professionals. However, the learning outcomes relating to special populations are unclear.</td>
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<td></td>
<td>Fitness Australia; Royal Australian College of General Practitioners (RACGP); Fitness Australia; Australian College of Rural and Remote Medicine (ACRRM)</td>
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<tr>
<td>2014</td>
<td>Nutrition 1</td>
<td>Global Fitness Institute Pty Ltd</td>
<td>At risk of being beyond scope</td>
<td>4 4 hours</td>
<td>Not stated</td>
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<td></td>
<td>Provides information on basic nutrition principles for healthy eating and basic information on diet-related chronic diseases and how food is used for bodily functions. Nutrition for chronic disease is considered beyond the scope of practice for fitness professionals, however the learning outcomes relating to chronic disease are unclear.</td>
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<td></td>
<td>Fitness Australia Online</td>
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<tr>
<td>Year</td>
<td>Program Title</td>
<td>Institution</td>
<td>Scope of Practice</td>
<td>Course Duration</td>
<td>Certifier</td>
<td>Accreditation Details</td>
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<tr>
<td>2014</td>
<td>Gold medal nutrition Human Kinetics</td>
<td>At risk of being beyond scope b</td>
<td>Provides information about sports nutrition, but also gives weight loss and muscle gain strategies. Sports specific nutrition is considered beyond the scope of practice for fitness professionals. However, the learning outcomes of the course are unclear. The course is taught by an APD, who may provide information in line with the recommended scope of practice for fitness professionals.</td>
<td>6 hours</td>
<td>Sports dietitian (APD)</td>
<td>Accredited by 9 associations, including Fitness Australia</td>
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<tr>
<td>2014</td>
<td>The ultimate nutritional guide for improved energy and digestive health</td>
<td>Australian Fitness Network Beyond scope c</td>
<td>Provides information about inflammatory foods and how to avoid them, nutritional alternatives to pain medications used to treat inflammation, lifestyle factors that cause low hormone levels and create obesity, and planning diets for coeliac disease or gluten sensitivities. This course encourages fitness professionals to provide meal plans for healthy and chronically ill clients. Such nutrition care is considered beyond the scope of practice for fitness professionals</td>
<td>8 hours</td>
<td>Not stated Nutritionist</td>
<td>Fitness Australia; REPs NZ</td>
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Online
<table>
<thead>
<tr>
<th>Year</th>
<th>Type</th>
<th>Provider</th>
<th>Additional Notes</th>
<th>Duration</th>
<th>Industry Approvals</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>Accredited certificate of nutrition</td>
<td>Cadence Health</td>
<td>Beyond scope</td>
<td>15 hours</td>
<td>42-78 hours of study</td>
<td>Not stated</td>
</tr>
<tr>
<td>2014</td>
<td>Certificate of optimal sports nutrition</td>
<td>Cadence Health</td>
<td>Beyond scope</td>
<td>15 hours</td>
<td>20 hours</td>
<td>Nutritionist and sports coach</td>
</tr>
<tr>
<td>2014</td>
<td>Certificate of weight loss</td>
<td>Cadence Health</td>
<td>Beyond scope</td>
<td>15 hours</td>
<td>42 hours</td>
<td>Nutritionist</td>
</tr>
</tbody>
</table>

On completion, fitness professionals are told they will be insured to provide dietary analysis, dietary modification and meal planning tailored to the individual. Cadence Health also noted that they may need to cut out 50% of the course (sports nutrition, weight loss nutrition, lifecycle nutrition, nutrition assessment) to align with the Fitness Australian scope of practice for fitness professionals.

This course is developed by sports nutritionist Leanne Cooper, with input from sports coach Don Singe. The Certificate includes topics outside basic healthy eating information, such as: supplementation, event meal planning, high protein diets, and nutrition for fuelling and recovery. Sports specific nutrition is considered beyond the scope of practice for fitness professionals.

The course includes modules on dietary assessment, diet diary reviewing, and
<table>
<thead>
<tr>
<th>Year</th>
<th>Course Title</th>
<th>Organisation</th>
<th>Duration</th>
<th>Scope</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>Nutrition for fertility, pregnancy and lactation</td>
<td>Cadence Health</td>
<td>15-20 hours</td>
<td>Not stated</td>
<td>Provides information on the nutrition needs of pregnant and lactating women, including information for weight loss, and nutrition to enhance fertility. Personal trainers are not supported to provide nutrition care to population groups with specific dietary needs, such as pregnant and lactating women, nor are they supported to provide information that is not within national dietary guidelines (such as nutrition for fertility).</td>
</tr>
<tr>
<td>2014</td>
<td>Nutrition for specific medical and physical conditions</td>
<td>FIA Fitnation</td>
<td>4-8 hours</td>
<td>Not stated</td>
<td>This short course continues on from the nutrition taught in the Cert III &amp; IV course. This course is stated to be necessary for fitness professionals that want to work in conjunction with other health professionals to help clients manage physical conditions by improved nutrition. It gives insight into nutritional deficiencies and how nutrition affects certain chronic diseases. Nonetheless, the information supplied is beyond the Australian Dietary Guidelines.</td>
</tr>
<tr>
<td>Year</td>
<td>Course Title</td>
<td>Provider</td>
<td>Additional Information</td>
<td>Duration</td>
<td>Delivery Format</td>
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<tr>
<td>2014</td>
<td>Nutrition for personal trainers</td>
<td>Fitness Industry Training Pty Ltd</td>
<td>Provides information on macronutrients, the role of hydration, pre and post workout meals for enhanced performance and recovery, the effect of nutrients on training effectiveness, food labelling, pre-screening and diets. This course includes topics that are likely beyond the basic healthy eating advice provided in the Australian Dietary Guidelines</td>
<td>13</td>
<td>2 days</td>
</tr>
<tr>
<td>2014</td>
<td>Exercise nutrition</td>
<td>Human Kinetics</td>
<td>Provides information on digestion, the advantages and disadvantages of supplementation, how to plan for an individual's hydration needs, and also provides updated research on nutrition for strength, power and ultra-endurance athletes, plus the effects of antioxidants on the cardiovascular system. These tasks are considered beyond the scope of practice for fitness professionals</td>
<td>8</td>
<td>More than 6 hours</td>
</tr>
<tr>
<td>2014</td>
<td>Nutritional assessment of the athlete</td>
<td>Nutrition Health &amp; Fitness Support Group</td>
<td>This program equips fitness and health professionals to collect dietary information, and undertake detailed anthropometry and individual nutritional assessment of their clients. Nutrition care for athletes is considered beyond the scope of practice for fitness professionals</td>
<td>7</td>
<td>Not stated</td>
</tr>
<tr>
<td>2014</td>
<td>Nutritional needs for training</td>
<td>Nutrition Health &amp; Fitness Support Group</td>
<td>This course covers topics that are beyond the scope of a fitness professional, including: estimation of energy requirements and expenditure of an athlete, the consumption and production of protein at different stages of exercise, and carbohydrate consumption for before, during and after exercise. Athletic</td>
<td>6</td>
<td>Not stated</td>
</tr>
<tr>
<td>Year</td>
<td>Course Title</td>
<td>Provider</td>
<td>Within scope</td>
<td>Description</td>
<td>Duration</td>
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<tr>
<td>2017</td>
<td>Nutrition for the health professional</td>
<td>Australian College of Fitness &amp; Bodywork</td>
<td>Within scope</td>
<td>This course provides information on healthy eating, nutrients, digestion, metabolic processes, as well as the problems with popular diets. It equips one with a basic understanding of nutrition to be able to better present basic healthy eating advice to one's own clients</td>
<td>12</td>
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<tr>
<td>2017</td>
<td>Calories, cookies and carrots. Nutrition for kids</td>
<td>Australian Fitness Network</td>
<td>Within scope</td>
<td>On completion of this course, fitness professionals will be able to appreciate and understand the importance of nutrition in children, be able to calculate BMI and will also know when to refer clients to specialised practitioners. Fitness professionals will be qualified to apply the Australian Guide to healthy eating for children</td>
<td>5</td>
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<tr>
<td>2017</td>
<td>Fuelling fat loss</td>
<td>Australian Fitness Network</td>
<td>Within scope</td>
<td>Provides information on the nutritional guidelines for fat loss, the role of the fitness professional in helping clients achieve nutrition goals, and current research on nutrition for fat loss</td>
<td>5</td>
</tr>
<tr>
<td>Year</td>
<td>Course Title</td>
<td>Provider</td>
<td>Mode</td>
<td>Hours</td>
<td>Time Frame</td>
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<tr>
<td>2017</td>
<td>Nutrition Psychology: food choice and eating habits</td>
<td>Cadence Health</td>
<td>Online</td>
<td>14</td>
<td>15 hours</td>
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<td><em>Within scope a</em> Uses theory of individual behaviour change to understand how to motivate individuals to make healthy food choices. Factors underpinning food choices including internal and external factors.</td>
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<tr>
<td>2017</td>
<td>Nutritional guidance</td>
<td>Health Republic</td>
<td>Online</td>
<td>2</td>
<td>2 hours</td>
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<td></td>
<td><em>Within scope a</em> Provides information on the guidelines for nutritional guidance all personal trainers must follow and contraindications that require referral to allied health professionals.</td>
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<tr>
<td>2017</td>
<td>Basic nutrition for personal trainers - practical advice for your clients</td>
<td>Recreation SA</td>
<td>Face-to-face</td>
<td>2</td>
<td>2 hours</td>
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<td></td>
<td><em>Within scope a</em> Provides information on the scope of practice for a personal trainer and gives a basic understanding about food and weight loss.</td>
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<tr>
<td>2017</td>
<td>Contains nut, dairy and wheat. A fitness professionals guide to food allergy and intolerance</td>
<td>Australian Fitness Network</td>
<td>Online</td>
<td>5</td>
<td>5 hours</td>
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<td></td>
<td><em>At risk of being beyond scope b</em> Provides information on common food allergies, intolerances and other food sensitivities and how to manage them to ensure nutritional needs are still being met.</td>
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<tr>
<td>Year</td>
<td>Course Title</td>
<td>Provider</td>
<td>At risk of being beyond scope</td>
<td>Course Duration</td>
<td>Qualification</td>
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<tr>
<td>2017</td>
<td>Exercise and nutrition for Type 1 Diabetes</td>
<td>Australian Fitness Network</td>
<td>At risk of being beyond scope</td>
<td>5 hours</td>
<td>APD</td>
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<tr>
<td>2017</td>
<td>Certificate of nutrition and diet</td>
<td>Beck Health &amp; Nutrition</td>
<td>At risk of being beyond scope</td>
<td>15 hours</td>
<td>Registered Nutritionist</td>
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<tr>
<td>2017</td>
<td>Certificate IV in weight management</td>
<td>Australian College of Weight Management</td>
<td>Beyond scope</td>
<td>15 Self-paced. Up to 12 months</td>
<td>Fitness professionals</td>
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<tr>
<td>2017</td>
<td>Sports nutrition for endurance training</td>
<td>Australian Fitness Network</td>
<td>Beyond scope</td>
<td>3 hours</td>
<td>Naturopath</td>
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<tr>
<td>Year</td>
<td>Course Details</td>
<td>Accreditation</td>
<td>Hours</td>
<td>Certificate Type</td>
<td>Location</td>
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<tr>
<td>2017</td>
<td>Boutagy Fitness Institute: Levels 1-4 in fat loss</td>
<td>Beyond scope</td>
<td>12</td>
<td>Not stated</td>
<td>Face-to-face</td>
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<td></td>
<td>Talks about nutrition prescription in course outcomes. It is considered beyond the scope of fitness professionals to prescribe any diet or nutrition.</td>
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<tr>
<td>2017</td>
<td>Metabolic Precision certificates 1-4</td>
<td>Beyond scope</td>
<td>3</td>
<td>Not stated</td>
<td>Face-to-face</td>
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<td>This course provides information around eating for sports performance, medical conditions and encourages meal and supplement planning. Such activities are beyond the scope of practice for fitness professionals.</td>
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<tr>
<td>2017</td>
<td>Precision nutrition certificate in exercise nutrition</td>
<td>Beyond scope</td>
<td>15</td>
<td>PhD doctorate</td>
<td>Online</td>
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<td></td>
<td>This course teaches fitness professionals how to be a nutrition coach and covers topics such as digestion, metabolism and nutrients. The program utilises the 'The Essentials of Sport and Exercise Nutrition' textbook, which gives information about supplementation, how to collect client data, how to formulate nutrition plans, and how to make specific individual nutritional adjustments for clients. These topics are beyond the current scope of practice for fitness professionals.</td>
<td>Accredited by 8 associations, including Fitness Australia</td>
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<tr>
<td>2017</td>
<td>Nutrition and metabolic syndrome/insulin resistance and inflammation</td>
<td>Beyond scope</td>
<td>2</td>
<td>Not stated</td>
<td>Online</td>
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<tr>
<td></td>
<td>Provides information on nutrition for chronic disease states including diabetes, metabolic syndrome, high cholesterol and blood pressure. Providing nutrition advice in these areas is considered beyond the scope of practice for fitness professionals.</td>
<td>Fitness Australia, American Council on Exercise, National Academy of Sports Medicine, Athletics Fitness Association of</td>
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</table>
Courses were considered:

a “Within scope of practice”: Advertised learning skills specified within the scope of practice
b “At risk of being beyond scope”: did not provide enough information to determine if nutrition content was within or beyond scope of practice, and
c “Beyond scope of practice” specifically stated they covered nutrition competencies beyond the national dietary guidelines, promoted individualised dietary guidance and/or meal plans, or blatantly specified a graduate competency that conflicted with the Fitness Australia scope of practice document