‘We work in silos’: Exploring clinicians’ perspectives on the dietary management of coronary heart disease and type 2 diabetes in an Australian public hospital and community health service

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Abstract

Aims: This study explored clinicians’ perspectives on roles, practices and service delivery in the dietary management of coronary heart disease and type 2 diabetes in a public health service.

Methods: Semi-structured individual interviews were conducted with 57 clinicians (21 nurses, 19 doctors, 13 dietitians and 4 physiotherapists) involved in the care of relevant patients across hospital and post-acute community settings in a metropolitan health service in Australia. Interviews were audio-recorded, transcribed verbatim and analysed using inductive thematic analysis.

Results: A total of 3 themes with 10 subthemes were identified. (a) ‘Treatment prioritisation’: important role of nutrition in risk factor management; competing priorities with complex patients; weight loss as a priority; and dietitians individualise. (b) ‘Diverse roles in providing diet advice’: a tension between nutrients, restrictions and diet quality; patients seek and trust advice from non-dietitians; and providing nutrition information materials crosses...
professions. (c) ‘Dietitian access’: variable integration and resourcing; access governed by clinician discretion and perceived patient interest; and bespoke application of referral pathways.

Conclusions: Time and resource constraints, variable access and referral to dietitians, and inconsistent advice were key challenges in the dietary management of coronary heart disease and type 2 diabetes. Models of care may be improved with greater investment and integration of dietitians, including to provide professional support across disciplines and disease specialties.

KEYWORDS
cardiovascular diseases, diabetes mellitus, diet, health services, nutrition, qualitative research

1 INTRODUCTION

Coronary heart disease and type 2 diabetes mellitus present major challenges to healthcare globally as they pose enormous financial burden and workforce challenges for health systems to manage.1,2 These chronic conditions are known to impact on quality of life and mental health, and result in increased healthcare utilisation and premature mortality.3 Furthermore, as coronary heart disease and type 2 diabetes share similar risk profiles and progression risk factors they are increasingly likely to coexist.2 Over 10 million deaths per year can be attributed to coronary heart disease and diabetes combined, and the disease burden continues to increase despite significant investments in health services and pharmaceutical research.1,2

Poor diet quality is a major contributor to the burden of chronic conditions and is a key modifiable risk factor for the progression and management of coronary heart disease and type 2 diabetes.5 Clinical guidelines recommend the inclusion of dietary counselling, delivered by a trained nutrition professional.6,7 Dietitian involvement in individual patient care planning has been shown to significantly improve health outcomes including weight management, and blood pressure, glucose and cholesterol levels,8 and is associated with lower healthcare costs (i.e., hospitalisation and medication).9 However, dietitians typically engage with patients much less frequently compared with nurses and physicians10 who are often responsible for delivering or facilitating nutrition-related care.11,12 The role and integration of dietitians is not always clear or facilitated13,14 which increases the risk of care being fragmented and patients receiving inconsistent or limited dietary advice.15 Nutrition philosophies and practice can also differ within the dietetics profession,16,17 or dietitians may struggle to evolve their practice alongside scientific evidence,18,19 which can add to the issue of conflict between dietitians and other professions.

Considering the increasing prevalence of comorbid chronic conditions, this presents a quandary of what nutrition care is being given and by who, the role of the dietitian, and integration within the broader interprofessional team. Specifically, it is not known how diet is being incorporated as part of coronary heart disease and type 2 diabetes management in real-world healthcare settings, whether there are conflicting approaches between health professional groups and condition-specific services, and whether care aligns to best-practice approaches. Gaps in knowledge are particularly prevalent in secondary and tertiary public healthcare services, as despite the important role these services play in providing specialist care to people with type 2 diabetes or coronary heart disease, much of the current literature that explores dietary practices in chronic disease management have been conducted in primary care settings. To implement service innovations and interventions to improve models of care, it is important to identify the current clinical problems, barriers, and facilitators regarding the dietary management of coronary heart disease and type 2 diabetes from health professional perspectives. To address current gaps in knowledge and implementation of best care diet-related practice in coronary heart disease and type 2 diabetes, all members of interprofessional teams involved in delivery of nutrition care and the integration of dietitians need to be considered to fully evaluate this problem. Therefore, the aim of this qualitative study was to explore professional roles, practices, and service delivery in the dietary management of adults with coronary heart disease or type 2 diabetes from the perspectives of healthcare professionals across a public hospital and community health service.
METHODS

This study employed a qualitative description approach and was reported in accordance with the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines (Supplementary checklist). This study utilised interview data collected for a broader study that investigated barriers and facilitators to implementing the Mediterranean dietary pattern in routine care for people with coronary heart disease or type 2 diabetes in a local health service context. The current secondary analyses investigated data related to the current aim that emerged outside of the objectives of the original study. The qualitative enquiry was designed to interrogate the challenges and enablers of translating research into practice by clinicians working within a complex real-world healthcare service and hence, the study philosophy was based in pragmatism. This approach allowed the authors to create coherence from the broad range of views of clinicians from multidisciplinary backgrounds and focus on solution-based interpretation of challenges described. The study was approved by the Metro South Human Research Ethics Committee (approval number HREC/2019/QMS/525).

Details on participants, recruitment, and data collection have been reported previously. Briefly, participants were recruited from five hospitals and eight community centres (providing post-acute services for chronic disease) within the metropolitan public health service, Metro South Hospital and Health Service, Australia. Eligible participants were clinicians who routinely treated patients with coronary heart disease and/or type 2 diabetes and who self-identified as providing nutrition education or referral to dietitians. Participants were initially identified by the research team, followed by a snowballing technique whereby participants could suggest other potentially eligible clinicians. The lead author (female dietitian and PhD with research, academic and clinical experience) initially contacted potential participants via email, or at an in-person meeting followed by email, including a detailed information sheet. All participants provided written or verbal informed consent. The sample size was based on the number of eligible contacted clinicians who agreed to participate which was deemed sufficiently rich information power to answer the research question and data saturation was not explicitly determined.

Individual semi-structured interviews were conducted by the lead author in-person or via telephone at the participant's workplace between November 2019 and March 2020. Interview guides (see Tables S1 and S2) were developed by the lead author who is a clinical research dietitian with expertise in chronic disease management, and in consultation with clinical and academic dietitians, and medical specialists. Relevant interview questions for dietitians related to their highest nutrition priorities to address within or across each speciality area, and the roles of other health professionals in diet-related care. Relevant questions for other clinicians related to the role of nutrition for relevant patients and available diet-related care, including their own role regarding advice and referrals. Where relevant, probing questions were used to seek clarification of responses and invite participants to elaborate. Interviews were audio-recorded, transcribed verbatim using an online audio-to-text automatic transcription service (Temi, 2020, California), and checked and edited for accuracy against the recordings. All participants were able to request to review their interview transcript.

Participant characteristics were summarised using descriptive statistics, performed in Microsoft Excel (2016, Microsoft Corp., Redmond, Washington). Interview transcripts were managed in Microsoft Excel and analysed thematically. Analysis was guided by Braun and Clarke's approach to thematic analysis, involving: familiarisation with the data; generating initial codes; searching for themes; reviewing themes; defining/naming themes; and producing the report. An inductive approach was utilised with coding derived from line by line analysis of the participant responses, with the key research questions providing a lens. All transcripts were coded independently by one researcher (Master's student dietitian researcher). A second researcher (also Master's student dietitian researcher) independently cross-checked and provided feedback on the coded transcripts. The lead author triangulated coding by cross-checking 50% of the coded transcripts for each profession and disease specialty and providing feedback. If there were inconsistencies or differing interpretations, these were discussed between the three researchers to reach a consensus and amend the coding. During the coding process, transcripts were grouped by profession and quotes were identified with profession which facilitated the identification of themes that may have been more prominent within certain professions. Through review of codes, initial themes were generated by the lead author, with mapping to illustrative quotes from across the involved professions and practice settings. This was iteratively reviewed and discussed between the broader authorship team, including dietitians in academic, clinical and executive roles, before a final agreement on the thematic synthesis was made. Engagement of the authors' multidisciplinary research team in interpretation of data enriched embedded reflexivity processes within the thematic analysis process.

RESULTS

A total of 57 participants (70% of n = 82 who were eligible and invited) were interviewed. Characteristics of
participants have been reported previously.\textsuperscript{22} The participants included 21 nurses (10 cardiac nurses and 11 diabetes educators), 19 doctors (9 medical specialists and 10 specialty trainees), 13 dietitians, and 4 cardiac rehabilitation physiotherapists. Most clinicians were female (70\%) and worked in a hospital setting (65\%), with a smaller proportion working in community clinics (30\%) or across both settings (5\%). The roles of 3 dietitians and 1 endocrinologist included work within Indigenous health services for Aboriginal and Torres Strait Islander people. Clinicians’ experience varied with a mean total time in clinical management of the relevant patient group of 12 ± 7 years (range 0.3–30 years). Interviews were generally evenly distributed between telephone (56\%) and in-person (44\%) with total mean duration of 28:35 minutes: seconds (range 14:49–54:28).

The inductive thematic analysis identified three key themes and 10 subthemes which are shown in Table 1 with illustrative quotes from across professions and disease specialities.

Within the theme ‘Treatment prioritisation’, a subtheme identified was related to an ‘Important role of nutrition in risk factor management’. Interviewed clinicians consistently described that nutrition has a ‘very important’ or ‘major’ role in the management of coronary heart disease and/or type 2 diabetes. This role was typically addressed in relation to traditional risk factors such as dietary modifications assisting with control of blood pressure, cholesterol, blood glucose levels and body weight. Risk factors described tended to be specific to conditions the patient already presents with, with limited consideration of management or prevention of broader comorbidities. Some doctors also acknowledged that poor dietary habits and obesity contribute to underlying disease pathophysiology.

‘Competing priorities with complex patients’ was a second subtheme whereby many clinicians discussed other priorities that compete with addressing diet as part of ongoing disease management. For doctors and nurses especially, time pressure within short or complex consultations was raised as a reason for diet assessment and/or advice being brief or not covered. These clinicians spoke about ‘focusing on their medications’ as the greatest priority with ‘less time on exploring those diet and lifestyle options’. Clinicians from across professions discussed that dietitian workflows prioritise acute clinical problems over long-term management or ‘overall healthy eating education’. Malnutrition was frequently raised as an acute priority, as well as symptom management such as fluid status in people with comorbid heart failure, and type 1 versus type 2 diabetes. These dietetics triage priorities were raised with regards to both hospital and community settings; however, dietitians working in community clinics tended to describe dietary care priorities which included a greater focus on long-term eating habits.

In the context of dietary management, participants frequently raised ‘Weight loss as a priority’. Overweight/obesity status or weight loss targets appeared to be a priority for clinicians referring to a dietitian and within brief advice given by non-dietetics clinicians, especially doctors. Dietitians also acknowledged weight loss as a potential priority of their dietary intervention. Some concerns were raised by both dietitians and nurses that doctors’ advice or referrals which focused on weight loss or energy restricted diets can be quite ‘directive’ and may not be suitable for many individuals. Nonetheless, some nurses and dietitians spoke about weight loss being a common goal for patients.

It was also apparent that ‘Dietitians individualise’. When asked about their diet-related priorities with patients, most dietitians stated that it is dependent on the patient’s personal priorities and specific risk factors, or that it would in part be directed by the concerns or questions patients raise regarding nutrition. Dietitians working in Indigenous community health services spoke about other priorities which superseded dietary counselling, including building trust and addressing food security.

Within the next theme ‘Diverse roles in providing diet advice’, a subtheme identified that there was ‘A tension between nutrients, restrictions and diet quality’. Many clinicians highlighted they prioritised diet advice that was based on individual nutrients that they perceived linked to a patient’s condition. Common recommendations included salt reduction to treat hypertension, lowering total or saturated fat to decrease cholesterol, and limiting total or refined carbohydrates to manage blood glucose levels. Doctors, nurses and physiotherapists generally focused on the restriction of nutrients or foods, such as takeaway, sugary drinks, or processed foods, rather than inclusion of healthy foods. They deemed these to be a ‘simple message’ which they could confidently relay to patients in a short timeframe. Although dietitians also described similar key nutrients or unhealthy foods within the focus of their dietary counselling, many also highlighted that more holistic dietary approaches which incorporate broader, inclusive food group recommendations should be used to improve an individual’s overall dietary pattern.

It was also apparent that ‘Patients seek and trust advice from non-dietitians’. Participants discussed that patients frequently ask non-dietetic clinicians questions about diet or expect them to have a sound understanding of the relationship between ‘diet and their disease’. Nurses regarded themselves as ‘a trustworthy profession’ or ‘central person’ in patients’ care and hence patients may rely on them to provide advice about diet. Some
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<th>Themes and subthemes</th>
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<tr>
<td><strong>Treatment prioritisation</strong></td>
<td>‘Nutrition is really important... it ultimately affects blood pressure and cholesterol’. (C2)</td>
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<td>Important role of nutrition in risk factor management</td>
<td>‘I think it's a very important role. A lot of patients with type two diabetes ah can greatly improve their control and potentially even reverse their diabetes with appropriate nutritional changes’. (E1)</td>
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<td>‘Hugely important for prevention of coronary artery disease, for management of cholesterol... reducing weight, reducing hypertension, improving diabetic profile’. (CN6)</td>
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<td>‘It's just so important. Because it's so tightly linked with, you know, what the body, like the insulin, the diabetes side of things’. (DN3)</td>
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<td>‘We’re trying to look at improving their blood sugar levels, or their lipid levels, or their risk factors’. (D03)</td>
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<td>Competing priorities with complex patients</td>
<td>‘There's obviously so much to get through when you are doing a consultation, and particularly you sort of always find yourself focusing on their medications’. (CT7)</td>
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<td>‘My dietary history is, would be, you know take up a minute or two of my consultation’. (ET2)</td>
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<td>‘So the malnutrition... I understand that it’s because of workload... that people [dietitians] have to prioritise about who they see’. (CN5)</td>
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<td>‘When we see them even as an inpatient, we have a very limited time to cover a lot of information. So nutrition is a very, very small part’. (DN3)</td>
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<td>‘Our [community clinic] triage criteria changed two years ago, so we do not see, I guess, the long-term management that we used to, so it's a bit more acute’. (D08)</td>
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<td>‘Then we go down to the lower priority, which would be the overall healthy eating education. Um, cause that's just to reduce the risks of further cardiovascular events. So once we have focused on the acute things, then we can focus on the chronic long-term things’. (D02)</td>
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<td>Weight loss as a priority</td>
<td>‘The focus of my nutrition advice is probably directed towards weight loss, um, a decent proportion of our patients are overweight or obese’. (C1)</td>
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<td>‘My standard is to tell them to lose 10 kilos in a year because all of them are a bit too overweight’. (CT1)</td>
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<td>‘Nutrition management is central to diabetes management and that's, you know, often around weight reduction’. (E3)</td>
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<td>‘It's [doctor's advice] often around you need to lose weight... I do not even know that it's that constructive... it's just a directive...not a, this is how you can do that or let me help you do that’. (CN5)</td>
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<td>‘A treating team refers a patient because they are obese and they want to pull their BGLs into line...and you know they want them to lose weight’. (D10)</td>
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<td>‘They do come with a range of comorbidities, heart failure, heart um hypertension, heart disease, etcetera. If they could just lose weight, everything would be resolved’. (D01)</td>
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<td>‘I see a lot of patients where the goal is some weight loss. That's usually a large factor as to why they are attending’. (D08)</td>
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<td>Dietitians individualise</td>
<td>‘First of all find out what the patient knows, what their understanding of their condition is, um, how they are feeling about it, what their stage of change is and then take it from there. Just work with that. So, key priorities for, um, managing risk factors for heart disease and diabetes. Certainly, it does not change an enormous deal, but if the client is not very interested or engaged in managing their blood glucose levels but they want to change their weight, then, that, then I will work from that perspective to engage them’. (D12)</td>
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<td>‘Well that [dietary priorities] really depends on the patient, does not it. So I think it’s very individualised’. (D13)</td>
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<td>‘I guess being an Aboriginal health service where I'm a white health professional, the first priority for me is to gain a bit of trust. So some, some appointments initially I do not give too much education as much’. (D07)</td>
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| **Diverse roles in providing diet advice** | 'Sometimes it's [group nutrition topics] just to be ad hoc depending on what is concerning people'. (D06)  
[Regarding dietitian referral] They’re going to get that in a much more detailed and individualised and knowledgeable way’. (CN3) |
| **A tension between nutrients, restrictions and diet quality** | 'I generally just try and suggest to avoid things like saturated fats, fast food, takeaway food, this sort of thing’. (CT2)  
'In type twos, I often try and limit their carbohydrate intake to better control their glycaemic variation on a day to day basis. Which is not always possible or very rarely achievable I guess’. (ET1)  
'For the patients with diabetes... their intake of carbohydrate... and for the heart disease patients, you are also looking at the types of fats'. (D13)  
'I always sort of try and promote from a whole food approach. So speaking about...not just individual nutrients'. (D01)  
'Ocasionally I see some messages around, you know, go for really low carb that'll help you control your diabetes... and then I get the referrals for...teach them about low carb eating and...that may not be appropriate for that person’. (D11)  
'Sometimes they [patients] want to move on to a very quick weight loss diet. So it’s usually discouraging that and talking about, you know, choosing more healthier, sustainable options for their diet’. (P3) |
| **Patients seek and trust advice from non-dietitians** | 'I think they probably see our role as important. I think, rightly or wrongly, um, doctors are seen as very much being, um, in charge of health care across the board. And diet comes into that’ (CT8)  
'From my experience the patient...often takes on board what the doctor says’. (ET2)  
'I think patients get really confused and overwhelmed by a lot of conflicting, um, people telling them to do different things’. (E2)  
'They do see the nurse as a central person. Like I think they sort of rely on us to give them advice about diets’. (CN1)  
'They often think I’m a dietitian’. (DN1)  
'‘That cardiologist told her to cut out all dairy and eggs. She was miserable. But she had literally done it... definitely they have a huge influence’’. (D10)  
'Often times they [doctors] may be missing the mark a little bit...and you have to do a little bit of damage control and say, well, you know, that's maybe not evidence based’. (D11)  
'They [patients] see both the nurse and myself as... the health professional that they have got contact with. So they will ask lots of questions... they see us as their go to first point’. (P1) |
| **Providing nutrition information materials crosses professions** | 'So if, you know, there were resources available for us to direct people to that might help us’. (CT2)  
'On like the heart foundation website, I think they are information sheets on this as well, but we tend not to use those because of the inconvenience of having to go and print it out and look for it’. (CT1)  
'There's a printout on Diabetes Australia, um, that I would just give them. I'm not exactly sure the exact recommendations on that printout, but I, uh, I'd print that out and ask them to have a look at things’. (ET2)  
'My heart my life is our major resource from the heart foundation... and the heart foundation website, you know, I say to people also has recipes on it that they can utilise from there’. (CN6)  
'We would tend to refer to resources ... such as the NEMO resources, the NDSS, you know, DAQ type resources and the Baker IDI resources. So if we do want to provide handouts to patients, those are the, those are the sort of, um, evidence based resources that we go to’. (DN8)  
'I use things like the Australian guide to healthy eating poster. Um, I use a plate, um yeah the portion plate. I use, um, mainly NEMO resources’. (D04) |
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<td>Dietitian access</td>
<td>‘If they have sort of, you know, had a few extra questions and there’s a handout available I feel okay to do that. And we have sort of checked in with the dietitians, the best available options there. So we use the Baker Institute quite a lot and then stuff that the dietitian here has developed and she’s happy for us to give that to the patients’. (P3)</td>
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<td>Variable integration and resourcing</td>
<td>‘Educating staff about what’s available in terms of resources...whether there is a dietitian service available to come to the ward, or, um, at the moment it’s kind of a bit hit and miss, I suppose’. (CT5)</td>
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<td>‘The hospital based service is so overloaded that they [dietitians] do not see a lot of... the consumers, most of them have pushed out into community’. (E3)</td>
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<td>‘I know in my diabetes clinic, um, I’ve got a dietitian down the corridor’. (ET2)</td>
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<td>‘More often than not, it comes back to their workload as to whether or not they can be seen...then they’ll [dietetics] weed out... what really needs to be seen and what does not’. (DN3)</td>
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<td>‘I feel like sometimes we do work in silos... It is a multidisciplinary team, but we still do work, you know, within our own professions...we do still pretty much just cover our role’. (D04)</td>
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<td>‘We work very closely in the multidisciplinary team’. (D01)</td>
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<td>‘They’ll put the information up and then we’ll open a discussion with that. So we are involved in, with it, because the dietitian’s not normally in the room they just provide the material’. (P2)</td>
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<td>Access governed by clinician discretion and perceived patient interest</td>
<td>‘It varies by consultant as to who sort of thinks it would be helpful. So not everyone that may need to see a dietitian gets, you know, sees one’. (CT5)</td>
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<td>‘It would be... particularly up for our discretion who to select, um, to make that referral... the people that, you know, I tend to refer are people who are certainly overweight and clearly have poor dietary habits’. (E4)</td>
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<td>‘We refer them, um, if the patient requests or if we think that they need a little bit more... education and support’. (CN1)</td>
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<td>‘We can also refer them to the GP as well if, um, if they want to be, you know, referred to a dietitian in the community... at patient’s request a lot of the time. It’s not like an automatic type thing. Um, I think it’s an area that could certainly be, we could certainly improve on’. (CN9)</td>
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<td>‘People have...interesting ideas on what a dietitian does. But by the time we sort of explain to them well... they can offer ideas and things, and guidelines... they sort of change their minds and they will actually go and see them’. (DN9)</td>
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<td>‘It’s really important to refer on and we’ll encourage the patients to go to see the dietitian cause they, you know, any information that they can get that’s going to be beneficial for their health is good’. (P3)</td>
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<td>Bespoke application of referral pathways</td>
<td>‘But in the public hospital... firstly, like we are not sure really how to refer to an outpatient dietitian’. (CT1)</td>
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<td>‘We would always put in our discharge summaries for the GPS to, you know, that advice was given about diet, you know, please follow up. Whether that happens, who knows’. (CT3)</td>
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<td>‘What actually constitutes an acceptable referral to those services is probably, it’s pretty tricky, for us, we do not sort of have much exposure to it’. (CT7)</td>
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<td>‘I do not know of any clear sort of referral criteria or inclusion exclusion criteria for either inpatients who are accessing hospital services or outpatients accessing hospital or community services’. (E3)</td>
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<td>‘So you have got a patient, they are asking us questions, you offer it to them, they accept, then you send an email to the dietitian and then they try and organise a time either before or after that gym session to come down and spend some time with that patient’. (CN4)</td>
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<td>‘I know it is available... it’s probably not something I’ve directly had, uh, contact with...if the patient wants to have a one on one that can be arranged with that dietitian here in</td>
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<td>this service and they, they book a room that's, I'm not sure where it is but it's elsewhere’. (CN10)</td>
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<td>‘If there's an availability in clinic and the patient's already here, um, the dietitian can opportunistically see them’. (DNS)</td>
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aD, dietitian; CN, cardiac nurse; DN, diabetes nurse educator; P, physiotherapist; E, endocrinologist; ET, endocrinology trainee; C, cardiologist; CT, cardiology trainee. Numbers were randomly allocated to distinguish clinicians. Baker IDI, Baker Heart and Diabetes Institute; DAQ, Diabetes Australia – Queensland; NDSS, National Diabetes Services Scheme; NEMO, Queensland Health ‘Nutrition Education Materials Online’ https://www.health.qld.gov.au/nutrition.

diabetes nurse educators perceived that patients may confuse them for dietitians. Similarly, physiotherapists perceived that patients in cardiac rehabilitation have more consistent contact with themselves and nurses than with dietitians so they may need to ‘field’ information.

Conflicting advice which can cause patients to be ‘confused and overwhelmed’ was a key concern raised across the professions. Dietitians and some nurses discussed that they face the challenge of doctors or other health professionals recommending specific diets that may not be appropriate or evidence-based, and that dietitians may have to do ‘damage control’. Some clinicians reported that diet advice provided by non-dietitians is based on their own personal experiences or beliefs. Some doctors commented that they rarely read dietitians’ chart notes and were often unsure what dietitians recommend to patients they manage. Dietitians emphasised that patients will typically trust and listen to the diet advice of doctors when given, and this may conflict with and negatively impact on patients utilising their own recommendations.

A final subtheme identified that ‘Providing nutrition information materials crosses professions,’ Dietitians described a range of information materials they provide to coronary heart disease or type 2 diabetes patients. Most typically, these were described as physical handouts or posters from local or national organisations. Nurses and physiotherapists also described that providing nutrition information materials to patients was part of their role. Although this included materials which they reported as being endorsed either by dietitians or the same local/national organisations, there was some uncertainty regarding whether materials they accessed were current. Some doctors noted websites or handouts they may direct patients to for nutrition information, however, this appeared to be less consistent and without direction from other team members. Doctors raised that having evidence-based resources, which are easily accessible to provide to patients during consults would be necessary within time constraints.

Within the final theme ‘Dietitian access’ a subtheme described ‘Variable integration and resourcing’ of dietitians between sites and cardiac and diabetes services. Some non-dietetic clinicians described being well linked to a dietitian in their clinical team, whereas a range of other clinicians were unsure about what dietitian services were available. Integration of the dietitian within a multi-disciplinary team appeared to be related to whether they were physically co-located within their specific outpatient clinic or community health service or not. It was raised that there are dietetics funding or workload constraints especially within the public health service, and that patients with chronic disease are ‘pushed out into community’ for allied healthcare coordinated by the General Practitioner. Several nurses and physiotherapists commented that access to dietitians within cardiac rehabilitation programs was limited or inconsistent and in some instances nutrition topics were presented by other clinicians or as pre-recorded material.

Dietitians shared conflicting perspectives, with some indicating they ‘work very closely in the multidisciplinary team’ compared with others who felt that ‘sometimes we do work in silos’ or that patients have greater access to other clinical team members. In general, there appeared to be limited collaborative practice between doctors and dietitians in the current service models. Notably, dietitians working in Indigenous health services spoke about being well resourced and that patients could access individual dietitian consults as well as a ‘nutrition promotion team’ that facilitated programs such as community cooking workshops.

A second subtheme related to ‘Access governed by clinician discretion and perceived patient interest’. Clinicians referring patients to see a dietitian appeared to be largely influenced by clinician discretion. As described by doctors, ‘it varies by consultant as to who sort of thinks it would be helpful’, their ‘role should be to pick up on who would benefit from dietitian review’ and they refer patients ‘that are struggling or have obvious issues with their diet’. Nurses and physiotherapists also discussed that they would refer to the dietitian based on their assessment of the patients’ diet and nutrition knowledge, or if patients ask in-depth questions which they deem are beyond their own scope. Clinicians from across professions also
described that their decision to refer or not relies on a 'patient's request' or is impacted by an individual patient's interest or motivation. It was raised that some patients ‘don’t want to see the dietitian’ or have had ‘poor responses to dietitians in the past’. It seemed to vary across the professions as to whether they would typically advocate or explain the dietitian’s role to patients and when this was done it appeared to increase the likelihood that patients would ‘change their minds’ or accept the referral.

Finally, there appeared to be ‘Bespoke application of referral pathways’. Clinicians’ understanding and implementation of referrals to dietitians varied between professions and services. Many doctors, especially in cardiology, were unsure how to formally refer or what the referral criteria to dietitians included for inpatient review or outpatient consultations. Where doctors did refer, this was often described as suggesting the patient access a dietitian through their General Practitioner and including this in their discharge summaries. Some doctors stated that they were unsure whether that pathway was executed and whether it would be subsidised. Nurses and physiotherapists appeared to have a better understanding of referral pathways within their own service and generating referrals was more embedded in their roles. The referral methods used were variable and some appeared to be ad hoc with nurses describing they may rely on the dietitian ‘opportunistically’ seeing patients if they have clinic availability.

4 | DISCUSSION

This study aimed to explore multidisciplinary healthcare professionals’ perspectives on roles, practices and service delivery in the dietary management of coronary heart disease and type 2 diabetes in an Australian metropolitan public health service. The primary findings highlighted, across the elements of the research question, that: (a) all members of interprofessional teams played a role in dietary management and there was broad acknowledgment from clinicians that nutrition is important; (b) nutrition practices, including advice, counselling and referrals, varied within and between clinical teams and healthcare settings; and (c) within current models and resourcing they faced challenges in prioritising and delivering dietary services as a core part of ongoing disease management with complex patients.

Nutrition-related treatment prioritisation varied across clinicians, sites and disease specialities. All clinicians in the current study broadly recognised the important role nutrition plays in coronary heart disease or type 2 diabetes and its link to disease risk factors. However, the inclusion, type and timing of nutrition practice were greatly dependent on individual, profession or setting-specific prioritisation. Similarly, other studies have demonstrated that clinicians across professions deem nutrition as important and an ideal part of care, but capacity and individual attitudes influence inclusion in routine practice.\(^{27,28}\) For the clinicians in tertiary settings, their understanding of nutrition’s role and how it was prioritised related predominantly to the condition they specialised in, despite presence or risk of comorbidities and other nutrition risk factors. Where dietary assessment or advice was prioritised, it tended to be siloed to individual disease risk factors and associated nutrient or food restriction. This is likely inter-related to service models with hospital teams and clinics being diabetes or cardiac specific. Comparatively, weight management was consistently raised as a diet-related priority, which is unsurprising given that obesity is a common risk factor recommended to be addressed in both coronary heart disease and type 2 diabetes.\(^{6,7}\) However, concerns raised by dietitians and nurses regarding the directness of some doctors' weight loss advice suggests that respectful and positive discussions about weight could be better adopted.\(^{29}\)

Growing workloads and health resource shortages are placing increasing demands on clinicians to practice in a highly time pressured environment. This appeared to be a key factor impacting whether or how non-dietetic clinicians chose to prioritise and implement nutrition into their care plans. Previous studies with doctors and nurses across primary care and hospital settings support this finding with time constraints being raised as a key reason for limited or no inclusion of diet assessment or advice for chronic disease.\(^{11,12,27,30}\) Within current workloads all professions expressed that providing nutrition education materials to patients was a reasonable role, provided that they are easily accessible. Having education materials available has previously been reported as important in influencing doctors' and nurses' decision to provide nutrition advice and dietitians suggested this as the top strategy for increasing the number of patients receiving nutrition advice from non-dietitians.\(^{11}\) This presents an opportunity for dietitians to equip their colleagues with up to date, consistent and evidence-based patient information. This appears to be especially important in cardiac rehabilitation programs where nurses and physiotherapists may deliver nutrition-focused education sessions in the absence of dietitian resourcing.

Involving dietitians in nutrition care planning for people with chronic conditions leads to better outcomes.\(^{8,9}\) This in part relates to the ability to spend adequate time and provide specific individualised counselling and support behaviour change.\(^{31}\) The current study supports this, revealing that dietitians tended to individualise nutrition care a lot more and focused on broader aspects of improving overall diet quality in the context of a person’s holistic
Clinicians’ initiating dietetics referrals was inconsistent and appeared to be linked to their understanding of the dietitian’s role and necessity. There were also incoherent referral processes and understanding of eligibility criteria to refer to dietitians. This directly impacted their position to advocate and encourage patients to consult a dietitian for their complex nutrition needs, as recommended in guidelines. Dietitians being poorly integrated into the multidisciplinary team may have been a consequence of limited advocacy or referrals, or the reason behind it. Previous studies have demonstrated that dietitians can often feel undervalued by doctors which influenced their decision to refer. In some Australian health settings as little as 0.3% of doctors’ consults result in a dietitian referral, indicating that referrals for specialist nutrition advice is not necessarily at the forefront for many healthcare providers. Physical co-location of dietitians with other team members was described as enhancing integration and opportunistic referrals in the current health service, and has previously been described to support collaboration and consistencies in nutrition advice. With increasing use of digital healthcare delivery, innovations for remote methods of multidisciplinary team collateral learning experiences will be necessary. Improving dietitian referrals and advocacy is an important area of research and policy needed to improve nutrition models of care in coronary heart disease and type 2 diabetes in tertiary settings, especially given that patients may present with limited interest or understanding of their role.

While the study findings suggest that supporting improvements in nutrition education skills and capability of the broader workforce and the integration/resourcing of dietitians is important, ideally other innovations to the structure and diversification of the healthcare workforce should be considered. For example, there is a growing body of evidence supporting the role of health coaching for motivating positive health behaviour change and consequent improvements in physical and mental health for people with chronic disease. Health services may consider investing in specific health coach roles as part of the multidisciplinary team or in health coach training of the existing workforce, with dietitians providing upskilling and oversight of their nutrition-related practice. Integration of assistance with health technology, which has a growing role in nutrition care, should also be addressed within the workforce and could be teamed with health coaching roles.

This study is strengthened by its diverse participant sample and the focus on clinicians managing patients in tertiary and post-acute community settings, rather than primary care, is novel. There are however several potential limitations to consider. The research team involved dietary pattern. However, access to dietitians was often inconsistent and limited within the current services. In particular, resourcing and workload priorities for dietitians in hospital settings are similarly time constrained and not focused on providing education/counselling. A time in motion study in Australia found that hospital dietitians across inpatient and outpatient settings spend less than one quarter of their time in direct patient contact and only 1% of their time providing dietary education. A consequence of this is the value both patients and non-dietetic clinicians place on the nutrition care that dietitians provide. For example, a key barrier to patients’ long term uptake of evidence-based nutrition advice relates to the patient and clinicians’ perception of the dietitian and the quality of their advice and previous satisfaction with dietetics services. Furthermore, dietitians may not be empowered to contribute to interprofessional collaboration and knowledge sharing within multi-disciplinary services, which is a barrier to embedding evidence-based nutrition culture and recommendations within teams. These collective findings highlight a deep-seeded cultural and historical issue which can only be ameliorated by better integration and collaboration with dietitians in coronary heart disease and type 2 diabetes service models and care planning.

Treatment and workload prioritisation, collegiality and training gaps are hindering the consistent implementation of nutrition care in chronic disease service models. Health professionals are experiencing uncertainty in their interprofessional boundaries with respect to nutrition education, and competence may not match patients’ expectations. Likewise, practice nurses in the United Kingdom have expressed they were expected to take on a more advanced role in diabetes nutrition education than they feel willing and able to provide. As a result nurses felt increasingly isolated with lack of time, practical and informational support, and training standards and provision. Similarly, in Australia, chronic disease practice nurses have expressed lack of nutrition knowledge and confidence which limits their perceived ability to provide up-to-date and reliable nutrition care to their patients. Cardiologists have reported limited nutrition knowledge to apply nutrition to everyday care. In primary care, the General Practitioner tends to have the role of coordinating the overall treatment plan and giving initial advice. This is in contrast to the current public health system, where nutrition care varies between the settings and services, with cross-over between roles of doctors, nurses and physiotherapists. Improving nutrition education and capacity building for medical and other healthcare professionals is on the global agenda with recommendations including embedding nutrition in training program curricula, online resources and adoption of nutrition education within healthcare organisations.
in data collection and analysis have diverse professional roles and backgrounds, however, are all dietitians. Participants were invited to review their interview transcripts prior to analysis however none chose to do so. In recognition of the involved clinicians’ limited time, participant checking was not conducted which may limit the confirmability and dependability of the research team’s interpretation.21 The findings of this study are limited to the perspectives of clinicians working in the relevant Australian public health service and may not be transferable to other health systems where models of care delivery are different. Finally, the findings from interviews represent the perspectives of clinicians only. Whilst clinicians provided useful insights to their relevant experiences with patients in everyday practice, the findings are not representative of patient perspectives or experiences. It is imperative that development of solutions to improve nutrition care in chronic disease models integrates findings from patient-focused studies and actively involves local consumers.

In conclusion, in the current public healthcare setting of hospital and post-acute community services all health professionals played a role in the dietary management of patients with chronic diseases; however, nutrition prioritisation and advice was varied and inconsistent across multidisciplinary teams and settings due to a complexity of factors. This study highlighted a broad importance of nutrition in the treatment and management of coronary heart disease and type 2 diabetes, from the diverse perspectives of doctors, nurses, dietitians and other allied health professionals. However, barriers and embedded issues relating to consistent and effective models of care appeared to be challenges hindering effective nutrition care for these patients. These findings suggest that models of care may be improved with more effective communication and collaborative care between dietitians and other clinicians to improve the consistency of nutrition approaches and establishing a collegial nutrition culture. In similar public hospital and community settings, implementation of more interdisciplinary nutrition education and skills training and direction to evidence-based materials, delivered by suitably trained and empowered dietitians, may help to increase clinician’s understanding of evidence-based nutrition information, the role of dietitians, and the services available. Workforce innovations such as the role of health coaching, including technology assistance, within the multidisciplinary team also warrants further investigation with regards to nutrition intervention. It is recommended that future studies investigate this topic within other health services and with engagement of patients to support the implementation of innovations to improve the dietary models of care for people with chronic disease. Future investigations could also focus more on eliciting in-depth explanations regarding why clinicians practice nutrition in certain ways.

AUTHOR CONTRIBUTIONS
HLM acquired funding, designed the original study and recruited participants with support from IJH, MP and KLC. HLM, JTK and IJH conceptualised the current study and analyses methods. HS and HLM co-led and all authors contributed to analysis and visualisation of the data. HLM and JTK drafted the article and all authors contributed to review and editing drafts of the article. All authors are in agreement with the article and the content has not been published elsewhere.

CONFLICT OF INTEREST
Ingrid Hickman is an Associate Editor of Nutrition and Dietetics. They were excluded from the peer review process and all decision-making regarding this article. This manuscript has been managed throughout the review process by the Journal’s Editor-in-Chief. The Journal operates a blinded peer review process and the peer reviewers for this manuscript were unaware of the authors of the article. This process prevents authors who also hold an editorial role to influence the editorial decisions made. The authors have no other relevant conflicts of interest to declare.

DATA AVAILABILITY STATEMENT
The data that support the findings of this study are not available due to privacy or ethical restrictions.

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REFERENCES


**SUPPORTING INFORMATION**

Additional supporting information can be found online in the Supporting Information section at the end of this article.