Title: Perceptions of primary care dietitians regarding the collection and use of outcomes data in practice: A qualitative study.

Authors: Peter W. Clark^{a,b}, Lauren T. Williams^a, Amy Kirkegaard^a, Bryce Brickley^a, Lauren Ball^a

^a Menzies Health Institute Queensland, Griffith University, Parklands Drive, Southport, Gold Coast, QLD 4222 Australia.

^b Healthier You Pty. Ltd, Lake Road, Port Macquarie NSW 2444 Australia.

Corresponding author:

Peter W Clark,
59 Lake Road, Port Macquarie NSW 2444.
Phone: +61265841880
Fax: +61265847762
Email: peter.clark3@griffithuni.edu.au

Authorship:

Authors PWC, LTW and LB contributed to the conception, design, data-collection, analysis; authors AK and BB contributed to the design and analysis. All authors participated in the drafting and finalisation of the manuscript.

Key words: qualitative research, data collection, benchmarking, perceptions, business acumen

Abstract:

Background: Dietitians working in primary care provide nutrition care to support individuals to prevent and manage chronic disease. A better understanding of the type and usage of data collected by dietitians in this setting may provide insights to optimise the effectiveness and impact of the workforce. This study explored the perceptions of leading Australian primary care dietitians on the collection and usage of data in their practice.

Methods: A qualitative descriptive study of Australian primary care dietitians recruited by snowball sampling, on their perceptions and attitudes towards collecting and using data. Data were collected by semi-structured interviews and all interview data were thematically analysed.

Results: Twenty-three dietitians participated. Five themes emerged: 1) Collecting data is challenging, nuanced, unclearly defined and therefore not routinely carried out; 2) Consistent data collection processes are impeded by the diversity of practice and practises; 3) Business-related data collection is essential for sustainable dietetic services; 4) Clinical outcomes are fundamental to dietetic services; 5) Standardised, integrated systems are needed to enable routine data collection and synthesis.

Conclusions: Our findings demonstrate the rudimentary role business acumen has in practice viability and provides evidence to potentially re-shape the future of dietetic education in Australia. Primary care dietitians may benefit from tools and training that enable consistent collection of data about their services. Such data could enable benchmarking across the workforce and contribute to a broader understanding of dietetic impact on public health.

Introduction:

Assessing the quality of health care requires the collection and synthesis of multiple data ⁽¹⁾. Establishing processes for the routine gathering, assessing and auditing of data has the potential to lead to improved quality of health care ⁽²⁾. Standardising data collection processes are a cornerstone of providing quality care and this approach underpins a range of quality assessment initiatives in the National Health Service in the United Kingdom ^(3, 4).

Medicare is Australia's universal health insurance program that delivers subsidised health care for all Australians and residents ⁽⁵⁾. Chronic disease is recognised as Australia's largest non-communicable health problem ⁽⁶⁾ and in 2004, the Australian Government introduced the Medicare Chronic Disease Management (CDM) program as a preventative measure to increase access for patients to a range of allied and other health services ⁽⁷⁾. However, the data collected in the Medicare scheme is limited to the price charged for the consultation and no information on the content, outcome or impact of care is captured ^(8, 9). A better understanding of such information could enable system efficiencies and provide guidance on quality improvement and effective resource utilisation.

There is no national system for standardised data collection regarding chronic disease management in Australia and a National Data Asset (NDA) has been proposed to provide a comprehensive understanding of patients' journeys within the health care system ⁽¹⁰⁾. Dietitians are the third most commonly referred allied health profession in the CDM program ⁽¹¹⁾, however, no data on dietitians is captured in the NDA. To optimise the role of the NDA in a truly integrated health care system, a better understanding of what data is being captured by dietitians is warranted.

In Australia, employment of dietitians in primary care (often referred to colloquially as "private practice") is one of the fastest growing areas of dietetic practice. Since 2004, the number of dietitians working in primary care has more than doubled ^(12, 13) and approximately one-third of dietitians are working in primary care in some capacity ^(13, 14). In addition to providing services through the CDM program, dietitians care for a range of other clients through funding schemes such as Department of Veterans Affairs, the National Disability Insurance Scheme, Workers Compensation and through a range of privately or personally funded insurance schemes. Little is understood on the data collection processes undertaken by primary care dietitians in practice and how that is being used to manage chronic disease. A better understanding of such data may inform an integral component of the NDA.

This study aims to explore the perceptions of primary care dietitians regarding the collection and use of data in practice.

Method:

This was a qualitative descriptive ⁽¹⁵⁾ study undertaken following the seven stages of interview inquiry (thematising, designing, interviewing, transcribing, analysing, verifying and reporting) ⁽¹⁶⁾. This study was part of a larger project examining the essential elements in developing a national dataset for dietitians in primary care (called the “Thought Leader Consensus” study). The protocol was approved by Griffith University’s Human Research Ethics Committee (Approval Number: 2020/607). The lead author has owned a primary care practice for fifteen years and is an Advanced Accredited Practising Dietitian (APD) which is a status awarded to Australian dietitians who have demonstrated high-level knowledge and skills in five domains of practice ⁽¹⁷⁾.

Study sample

High-profile dietitians who were considered “thought leaders” (TLs) in primary care based on their national profile and the influence they have on their peers in the profession, were identified. The practice of using TLs to examine critical aspects of dietetics has been used previously ⁽¹⁸⁾. TLs were identified through professional networks and snowballing. Initially, an internal research panel (made up of academics and PhD candidates) were asked to nominate TLs they felt would be appropriate to participate. Twenty-six TLs were invited to participate. A three-minute video was produced by the research team to outline the experience of the researchers, the aims of the study and requirements for participation. TLs were e-mailed an invitation to participate, which contained a link to the video and a participant information sheet and consent form. Where initial contact did not elicit a response, a further email or phone call was placed.

Data Collection

A semi-structured interview protocol was developed by the research team and informed by protocols previously used by others ^(19, 20). The questions examined aspects of current and desired data collection and usage. Pilot interviews were completed with four dietitians (senior academics and PhD candidates) to assess and improve the flow of the interview process. Minor changes were made, and the interview guide was finalised. Pilot interview data did not inform the final analysis. Thirty-minute interviews were scheduled via teleconference (in their office or home setting) or telephone when videoconferencing was not available. The TLs were emailed a copy of the interview questions at least one week prior to the interview. Interviews were completed by the lead author individually with each TL. Verbal consent to participate in the study was recorded at the start of each interview. The interviewer recorded field notes through the interviews. All interviews were recorded and stored on a password protected database in Microsoft Teams enabling review by the

research team. A voice-to-text transcription service was used for verbatim transcription of the interview and each transcript was reviewed and corrected (as required) by the lead author. Transcripts were emailed to TLs for their approval. Each participant provided written verification of the accuracy of the transcript. Transcripts were then deidentified for further analysis.

Data analysis

Consistent with the methodology for qualitative research and semi-structured interview principles used by others ^(16, 21-25), inductive coding occurred following data collection. Transcripts were coded using NVivo (QSR International) to organise and group data into categories. Codes were developed to describe complex concepts, expressed in everyday language, aimed at capturing the fullness of the experiences and actions studied ^(15, 16). Data instances were compared for similarities and differences and categories of codes (concept or data driven) were developed. Data were double coded by two members of the research team and triangulation was conducted in team meetings whereby themes and subthemes were reviewed to ensure they reflected the data for consistency and credibility.

Results:

Twenty-three dietitians (88% of the TLs that were invited) took part in an individual semi-structured interview (on-line videoconference n = 22; telephone n = 1). The predominant reason for declining participation was competing priorities for time. Interviews lasted approximately 30minutes (range 29-47 minutes).

Demographic details of participants are described in Table 1. Approximately three-quarters of the participants identified themselves as female (n=17, 74%). Representation was achieved from all mainland states, with most participants based in NSW, Victoria and Queensland (n=19, 83%). Participants worked in various locations, with more than two-thirds being metropolitan based (n=16, 70%). The majority of the participants (n=21, 91%) were currently practising as APDs. APDs had varying degrees of experience, with three achieving the status of Advanced APD ⁽¹⁷⁾. The majority of the TLs had between 6-19 years practice experience with a further 30% having >20 years of experience. Practice sizes range from solo practitioners to large group practices employing >20 dietitians nationally.

INSERT Table 1 Here

Five themes emerged from the interview data. The themes and sub themes are briefly described below with illustrative quotes provided in Table 2 and described in text below.

INSERT Table 2 Here

Theme 1: Collecting data is challenging, nuanced, unclearly defined and therefore not routinely carried out.

There were varied opinions regarding outcomes assessment in primary care dietetics. Some chose to focus initially on clinical outcomes. Most took a whole of practice perspective, describing both clinical and business-related outcomes. One participant commented “*I'm glad to hear that you're focusing not just on the ... clinical side, but also on the business side. I think that's an important practical consideration that often gets lost.*” – TL1.

Many participants discussed the challenging nature of collecting data related to their interactions with patients. Some discussed challenges in identifying appropriate short-term measures of impact of nutrition education when the desired effect of the intervention may have long lead times. Others expressed doubts as to whether nutritional education alone was enough to generate a desired clinical outcome due to a range of confounding factors that are involved. Some expressed that the degree of client engagement makes standardised assessments challenging.

Theme 2: Consistent data collection processes are impeded by the diversity of practice and practises.

Participants identified differences in settings (e.g., office based, on-line etc.), practice sizes (e.g., solo practice, groups settings, national organisations), practice structures (e.g., dietitians alone, part of cross functional teams) and clinical focus (e.g., metabolic disorder, eating disorders, irritable bowel syndrome (IBS), reproductive health, sports nutrition etc). The diversity of practise and complexity of different types of practices were seen as reasons why it is challenging for the profession to develop standardised, consistent outcome collection processes.

The diversity of needs for collecting data appeared to impede consistent outcome collection. Some did not feel the need to collect outcomes data. Others (particularly in mature practices) justified that because they were “busy enough” currently, they did not need to identify opportunities to expand their services. Contrastingly, some practices had developed a range of sophisticated processes for gathering, recoding, collating and analysing data with a range of software packages to increase the capacity of their dietetic service.

Participants exhibited a diverse range of skills at outcomes collection. Some dietitians showed a breadth of experiences and had sought specific training through formal qualifications or business mentoring. In contrast, others had no formal training and were not able to describe effective processes for collecting data. Some dietitians called for standardised outcomes training to be included in the nutrition courses offered in universities to ensure uniformity of implementation. There were a diverse range of software systems identified by participants to collect and analyse data. These included electronic management software systems (EMS), secure e-mail messaging systems, financial packages, data analysis tools, bioimpedance software systems and commonly used platforms and communication tools such as Microsoft office package. Within the 21 practising dietitians there were nine separate EMS used to record client notes, with Halaxy (n=7), Clinico (n=4) and Best Practice Allied (n=3) the most popular. In addition, three international

systems were under investigation for future use. One dietitian continued to use a paper system with no intention of changing.

Various reasons were cited as to the diversity of EMS usage including cost, availability in clinic location, ease of use and familiarity with current system. Many participants expressed frustrations with their systems. Many commented the inability to collate data and the lack of integration with other systems limits data usability and prevents standardised outcome assessments.

Theme 3: Business-related data collection is essential for sustainable dietetic services.

All participants identified business data collection as a measure of outcomes for their practice. The range of data and business processes varied. Many expressed that business processes are foundational to providing a dietetic service and without it, a clinical service would be unsustainable. Two participants described it as: “*So, you know if we're not running effective businesses, we can't be effective for our clients.*” – TL 5 and, “*So, if there's not a financial model that can support it well, you may as well give up because you can't be a charity.*” – TL 7.

The range of business data identified by the participants fell into five main categories: business decisions and processes; generation of business; retention of clients; financial analysis; and employee suitability, training, utilisation and effectiveness. The frequency of data assessments varied with most reviewing their performance monthly, quarterly and annually. Many described the importance of establishing standardised processes and procedures for making business decisions to generate service utilisation. With such processes, many described the range of data they capture on referrers, clients and their own business structure, used to expand service utilisation. Once a client is engaged in the service, many dietitians have processes (e.g., package bundles) and outcomes assessments for retaining the client (aimed at increased practitioner utilisation or reduced cancellations), thus expanding their revenue. Although some participants expressed the importance of examining the new client to review client ratio for retention, there was disparate opinions expressed on what an appropriate number for that to be. Participants outlined a range of financial metrics used to examine the effectiveness of their strategies and how that information can enhance employee identification, training and retention to enhance client and referred satisfaction. The use of client satisfaction indexes is recognised by many as valuable but not routinely performed. Satisfaction indexes were more commonly used to assess the implementation of a specific program.

Theme 4: Clinical outcomes are fundamental to dietetic services.

Generating appropriate clinical outcomes were seen by many as the fundamental purpose of engaging with a dietetic service. The clinical outcome measures identified by many participants fell into five main categories: anthropometry; biochemistry; clinical; dietary changes; and targeted use of validated rating scales to demonstrate specific clinical changes. The clinical focus of the dietitian (or the practice) played a role in the types of outcomes gathered. In addition, the client type and need, condition treated, client motivation, stage of treatment and the tools available to collect and collate such information, are all factors in data collection. The use of validated rating scales (e.g., Tylka Intuitive eating scale ⁽²⁶⁾) was seen by some as an important objective measure of success. However, rating scales were generally tailored to a particular approach/focus (e.g., IBS), which hinders their ability to be standardised to wider primary care dietetics.

Theme 5: Standardised, integrated systems are needed to enable routine data collection and synthesis.

Many participants expressed a desire for a standardised system that could be routinely used across the profession for collecting and synthesising data about their service. Standardised systems were seen by many as a way of consistently capturing outcomes. Some expressed a need to use such data to benchmark with other practices and use that data to demonstrate their effectiveness. Others saw a broader benefit with the possibility of combining data across a range of practices in a consistent format to demonstrate the effectiveness of Medical Nutrition Therapy (MNT) on the health of clients seeking dietary advice. Participants described various features of standardised systems including functionality, automation and integration with other systems. The outputs of such systems were seen as having the potential to improve core business and clinical metrics and determine the linkage of dietetic utilisation to desired clinical changes. Many felt this would identify areas to target for expansion of their services to improve client retention and improving dietitian utilisation and productivity.

Discussion:

To the best of our knowledge, this is the first study to examine the perceptions of leading dietitians regarding collecting and using data in practice. Until now, little was understood about the data collected in primary care dietetics and this study provides valuable insights as to what data is collected and how that data collection could be enabled.

This study has identified some notable barriers to data collection. Many dietitians saw the collection of outcomes data as nuanced and challenging as they aim to apply evidence-based data to the complicated multifunctional role that food plays in the client's life ⁽²⁷⁾. Diversity in scope of practice, the need for data, the tools to collect data and the overall training to do so, led to a call by many participants for standardising the education on data collection at the undergraduate level. Standardised outcomes data training is a need recognised by others previously ^(24, 28, 29) and a better understanding of the essential elements for such training requires further investigation.

A major finding of this study is that all participants self-identified as small business owners. To provide sustainable clinical services, practices have to be financially viable. Primary care dietitians have identified sophisticated processes to identify, generate, retain and expand the services they provide. Although business acumen ⁽³⁰⁾ and aspects of identification and retention of clients to a clinical service has been discussed by others ^(29, 31), this study has identified the intricate relationship these aspects have to fundamental financial measures to ensure practice viability. Although, most participants had no formalised business training, many had upskilled by seeking specific training or mentoring. The need for business skills training for dietitians has been recognised by others ^(13, 32). However, some participants went further, calling for business training and formalised business mentorship or expansion of university education to include formalised preceptorship training (such as that seen in psychology training) before a dietitian can work in primary care practice. Given the potential accreditation and credentialling implications, the broader need for such initiatives requires further investigation.

The clinical outcome measures identified in this study are consistent with the standardised clinical outcomes assessments recommended in international practice guidelines ^(33, 34) and in other studies of dietetics practice ^(24, 29). However, this study also identified how some dietitians use that data to demonstrate the relationship between dietitian activity (i.e., number of consultations) and resultant changes in client diet quality, improvement clinical measures (e.g., changes in weight or biochemical parameters) and subsequently satisfaction. Routine collection of satisfaction indices is evident in other areas of allied health ^(29, 31, 35), including some aspects of dietetics ⁽³⁶⁾. In this study,

the use of such tools in practice was more *ad hoc* and isolated to specific clinics with specific dietary foci. A more uniform approach to linking the productivity of the clinician and the effect the intervention has on clinical improvements and satisfaction of the client, may provide valuable insights into dietitian efficiencies and effectiveness and provide a benefit to all stakeholders in their care.

There is a need to develop more uniformity in the use of effective tools and processes for data collection. This is the first study to examine the diversity of EMS tools use by dietitians and has identified, similar to other professions ^(8, 37), a wide variability in use. The variability in systems and the lack of integration between systems has led to the call by many participants for the development of a uniform platform for data collation and benchmarking across the profession. This study demonstrates the need for a framework for critical thinking and decision-making in primary care in Australia, similar to the nutrition care process developed by the then American Dietetic Association in 2003 ⁽³⁴⁾. The use of outcomes data for benchmarking service effectiveness has been recognised by others ^(24, 29) and would be an essential element of the NDA ⁽¹⁰⁾. Although the exact specifications of such a tool would require further investigation, elements such as ease of use, automation and integration with other systems were identified in this study.

The study has various strengths. The findings are drawn from the perceptions of a breadth of peer-nominated experienced, TLs, operating practices of varying sizes and scopes, across each mainland state. The methodology used in this study is evidence-based ^(18-20, 24) and the findings provide the first examination of the perceptions of leading primary care practitioners on the work they do. There are, however, some limitations to this study. Caution should be taken when interpreting these findings from 23 TLs, as other views and practises may not be captured by this group. In addition, the lead author is a primary care dietitian, which may introduce bias to the analytical phase. Independent double coding, collaborative de-briefing and ongoing reflection were important to mitigating any biases introduced from the self.

In conclusion, this is the first study to describe the perceptions of outcomes assessments by high-profile Australian primary care dietitians. Practice viability is a critical outcome measure and is fundamentally dependent on the business success and acumen of the dietitian. There is a strong call for better training and standardised tools to be developed to enable consistent outcome assessments. Further research needs to be conducted to examine the minimum standards required to develop a national dataset of outcomes assessment of dietetic activity. Consistent implementation of such a standardised tool in primary care could provide a powerful asset to demonstrate the effectiveness of MNT on clients of dietitians.

Source of funding, conflict of interest:

This research did not receive any specific grant from funding agencies in the public, commercial, or non-for-profit sectors. LB's salary was supported by a National Health and Medical Research Fellowship (APP 117346).

The authors have no potential conflict of interest to declare. As of June 2021, LB holds a role as Associate Editor of JHND.

Acknowledgements:

The authors wish to thank participants for their time contributing to the project.

Transparency declaration:

The lead author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported. The lead author affirms that no important aspects of the study have been omitted and that any discrepancies from the study as planned have been explained.

Statement of ethical approval:

This study was approved by Griffith University's Human Research Ethics Committee (Approval # 2020/607).

References:

1. Donabedian A. The quality of care: How can it be assessed? JAMA. 1988;260(12):1743-8.
2. Ivers N, Jamtvedt G, Flottorp S, et al. Audit and feedback: effects on professional practice and healthcare outcomes. Cochrane Database Syst Rev 2012;2012(7):CD000259-CD.
3. National Health Service and National Health Service Improvement. Quality, service improvement and redesign tools: A model for measuring quality care. Available from: <https://www.england.nhs.uk/wp-content/uploads/2021/03/qsir-measuring-quality-care-model.pdf>. Accessed June 2021.
4. Donabedian A. Evaluating the quality of medical care. The Milbank Quarterly. 2005;83(4):691-729.
5. Australian Government - Department of Health. Medicare 2017. Available from: <https://www1.health.gov.au/internet/main/publishing.nsf/Content/health-medicarebenefits-healthpro#>. Accessed June 2021.
6. Australian Government - Department of Health. National Strategic Framework for Chronic Conditions 2019. Available from: <https://www.health.gov.au/resources/publications/national-strategic-framework-for-chronic-conditions>. Accessed June 2021.
7. Australian Government - Department of Health and Aging. History of key MBS primary care initiatives 1999-2013. Available from: <https://www1.health.gov.au/internet/main/publishing.nsf/Content/mbsprimarycare-History>. Accessed June 2021.
8. Foo J, Haddock, R. Data collection for community-based allied health chronic disease management. Deeble Institute Issues Brief. 2020;36:1-27.
9. Crettenden I, McCarty M, Fenech B, et al. How evidence-based workforce planning in Australia is informing policy development in the retention and distribution of the health workforce. Human Resources for Health. 2014;12(1):7.
10. Australian Government - Australian Institute of Health and Welfare. Primary Health Care Data Development 2020. Available from: <https://www.aihw.gov.au/reports-data/health-welfare-services/primary-health-care/primary-health-care-data-development>. Accessed June 2021.
11. Cant R, Ball L. Decade of Medicare: The contribution of private practice dietitians to chronic disease management and diabetes group services: Dietitians' contribution to Medicare CDM. Nutrition & Dietetics. 2015;72(3):284-90.

12. Jansen S, Ball L, Lowe C. Impact of the Medicare Chronic Disease Management program on the conduct of Australian dietitians' private practices. *Australian Health Review*. 2015;39(2):183-9.
13. Ball L, Eley DS, Desbrow B, et al. Association between dietitians' personality profiles and practice areas. *Nutrition & Dietetics*. 2016;73(3):247-53.
14. Mitchell L, Capra S, Macdonald-Wicks L. Structural change in Medicare funding: Impact on the dietetics workforce. *Nutrition & Dietetics*. 2009;66(3):170-5.
15. Sandelowski M. Whatever happened to qualitative description? *Research in nursing & health*. 2000;23(4):334-40.
16. Kvale S, Brinkmann S. *InterViews: Learning the Craft of Qualitative Research Interviewing*. Third ed. Los Angeles: SAGE Publications; 2015.
17. Gifford J, Snell R. Barriers and enablers to applying for the Dietitians Association of Australia Advanced Accredited Practising Dietitian credential: A qualitative analysis: DAA Advanced APD credential review. *Nutrition & Dietetics*. 2015;72(2):132-42.
18. Rhea M, Bettles C. Future Changes Driving Dietetics Workforce Supply and Demand: Future Scan 2012-2022. *Journal of the Academy of Nutrition and Dietetics*. 2012;112(3):S10-S24.
19. Ding J, Cook A, Chua D, et al. End-of-life care in general practice: clinic-based data collection. *BMJ Supportive & Palliative Care*. 2020; 2045-435X:1-9.
20. Cant R, Aroni R. Melbourne dietitians' experience of Medicare policy on allied health services (strengthening Medicare; Enhanced Primary Care) in the first 12 months. *Nutrition & Dietetics*. 2007;64(1):43-9.
21. Corbin J, Strauss AL, Publications S. *Basics of qualitative research: techniques and procedures for developing grounded theory*. 3rd Ed. Los Angeles, Calif: SAGE Publications; 2008.
22. Mack N, Woodsong C, Macqueen K, et al. *Qualitative Research Methods : A Data Collector's Field Guide*. 2005. Available from: <https://www.fhi360.org/resource/qualitative-research-methods-data-collectors-field-guide>. Accessed June 2021.
23. Jones A, Mitchell L, O'Connor, R. et al. Investigating the Perceptions of Primary Care Dietitians on the Potential for Information Technology in the Workplace: Qualitative Study. *Journal of Medical Internet Research*. 2018;20(10):E265, 1-9.
24. Cant R. What outcome measures do Australian dietitians use to evaluate nutrition education interventions with individual patients? *Nutrition & Dietetics*. 2008;65(4):284-91.
25. Braun V, Clarke V. *Successful Qualitative Research: A Practical Guide for Beginners*. London: SAGE Publications; 2013.

26. Tyka TL. Development and Psychometric Evaluation of a Measure of Intuitive Eating. *Journal of Counseling Psychology*. 2006;53(2):226-40.
27. Swift JA, Tischler V. Qualitative research in nutrition and dietetics: getting started: Getting started in qualitative research. *Journal of Human Nutrition and Dietetics*. 2010;23(6):559-66.
28. Commission on Accreditation for Dietetics Education - American Dietetic Association. Appendix E: Foundation Knowledge and Skills and Competency Requirements for Entry-Level Dietitians. National Academies Press; 2000. p. 342-51.
29. Moretto N, Stute M, Sam S, et al. A uniform data set for determining outcomes in allied health primary contact services in Australia. *Australian Journal of Primary Health*. 2020;26(1):58-69.
30. Harper C, Maher J. Investigating philosophies underpinning dietetic private practice. *Behavioral Sciences*. 2017;7(1):11, 1-19.
31. Comans TA, Clark MJ, Cartmill L, et al. How do Allied Health Professionals Evaluate New Models of Care? What Are We Measuring and Why? *Journal for Healthcare Quality*. 2011;33(4):19-28.
32. Hewat C. Primary health care: The new frontier. Are dietitians on the front line or just bring up the rear? *Nutrition & Dietetics*. 2009;66(2):72-3.
33. Vanherle K, Werkman AM, Baete E, et al. Proposed standard model and consistent terminology for monitoring and outcome evaluation in different dietetic care settings: Results from the EU-sponsored IMPECD project. *Clinical Nutrition*. 2018;37(6):2206-16.
34. Lacey K, Pritchett E. Nutrition Care Process and Model: ADA adopts road map to quality care and outcomes management. *Journal of the American Dietetic Association*. 2003;103(8):1061-72.
35. Fennelly O, Blake C, Desmeules F, et al. Patient-reported outcome measures in advanced musculoskeletal physiotherapy practice: a systematic review. *Musculoskeletal Care*. 2018;16(1):188-208.
36. Cant R, Aroni R. Eleven process evaluation strategies for education of individual clients in dietetic practice. *Nutrition & Dietetics*. 2009;66(2):87-93.
37. Australian Physiotherapy Association. Practice Management Software Insight 2018. Available from: https://australian.physio/sites/default/files/advocacy/download/APA_PM_Software_Audit_Oct_18_Final.pdf. Accessed June 2021.

Table 1: Participant demographic details including gender, location, geographic responsibility and dietitian employment details (n=23).

Category	n (%)
Gender	
Female	17 (74)
Male	6 (26)
Location	
New South Wales	9 (39)
Queensland	6 (26)
Victoria	4 (17)
Australian Capital Territory	2 (9)
South Australia	1 (4)
Western Australia	1 (4)
Geographical Responsibility	
National	2 (9)
Metropolitan	16 (70)
Regional	3 (13)
Rural/Remote	2 (9)
Employment Details	
Employment Status	
APD	18 (78)
Advanced APD	3 (13)
Not currently practising as dietitian	2 (9)
Employment as a dietitian (years)	
0-2	1 (4)
3-5	1 (4)
6-10	7 (30)
11-19	7 (30)
20+	7 (30)
Employed Dietitians (full time equivalents)	
Employed in non-practising role	2 (9)
Solo practitioner	8 (35)
2-3	6 (26)
4-10	4 (17)
11-19	2 (9)
20+	1 (4)

Table 2 Themes, sub themes and illustrative quotes from dietitians regarding their perceptions of outcomes data collection

Theme	Sub theme	Quote
Collecting data is challenging, nuanced, unclearly defined and therefore not routinely carried out	Challenge of demonstrating the relationship between nutrition care and improvements in health	<p><i>“The clinical outcomes, whether they manifest or not, are too complex to be able to ascertain and run for every single condition.” – TL 16</i></p> <p><i>“But process measures by themselves are not enough because, you can do the right things but not achieve the outcomes you want. I suppose the only other thing is that collecting outcomes is incredibly nuanced and difficult. A lot of the things you are trying to intervene on have very long lead times. You might not show any changes for several years.” - TL 1</i></p>
	No clear definition of outcomes data	<p><i>“When you say outcomes, are we talking client outcomes or more things like total appointments, and cancellation, that sort of thing?” – TL 9</i></p> <p><i>“There are outcomes based on clinical dietetic care and outcomes based with the patient. And then there's outcomes based on a business owner and business perspective of performance of the organisation. Performance of the dietitian. Are we talking about everything?” – TL 16</i></p>
Consistent data collection processes are impeded by the diversity of practice and practises	Diversity of practice in which dietitians work	<p><i>“We might only need a few consultations for say cholesterol, but for weight loss we tend to need more to get their outcomes that we're looking for. For GUT areas, we tend to need more consultations because they tend to be more complex. So, we're kind of tracking a little bit more to see, are we able to support our clients to be able to achieve those things?” – TL 12</i></p>

	<p>Diversity of need for data impacts consistent data collection</p>	<p><i>“Data can be fed straight into Power BI. So, in the background, someone has formulated a dashboard, so they gain instant insights in terms of how they are performing, and that feed again is automated. You can create leader boards. You can see how you're performing against the averages, and you can use that to promote your practice to all your referrers.” - TL 7</i></p> <p><i>“I'm embarrassed to say that I don't bother with outcomes. Basically, a successful practice is outcome enough.” – TL 13</i></p>
	<p>Data collection is impacted by the amount of training available</p>	<p><i>“I was always advocated for training for dietitians having more data skills and more business knowledge. Or whether we have practices that have to be accredited like GP practices. And part of that accreditation is that you needed to have done sort some sort of business training.” - TL 22</i></p>
	<p>Use of software tools is diverse and are limited in their use</p>	<p><i>“I mean everyone's using different practice software programmes. There should be some sort of consistency. And it needs to be in the practice software programme so that when you're collecting it you can do a report to collate it.” – TL 23</i></p> <p><i>“Some people are just using a word document to record their notes and saving it in a folder. It's not that easy to pool. So, if you want to provide some kind of tool where they could ideally record or templates that does some data extraction, that would be useful... There is a massive disparity amongst what kind of clinical software they are using.” – TL 2</i></p>

Business-related data collection is essential for sustainable dietetic services	Establishment of processes for making business decisions	<i>“Unless it forms part of the systematic process, and unless it's easy and it reduces the burden on the clinician, it is very hard to get clinicians to change. No matter how much you are motivated by, and you can see the outcome.” – TL 7</i>
	Identification of strategies to generate business	<i>“I guess I record everybody who comes through my door. Because I want to know where I am putting my effort into building these networks and which ones are beneficial. Which ones are not so beneficial? Where do I want to spend more money or less money on advertising? ...Who's finding me? Where are they finding me? How are they finding me?” - TL 17</i>
	Establishing strategies for current client retention	<i>“So, the very first appointment is designed to give people what we call in our practices, and in psychology, anchoring and priming. Getting people prepared that this is the first appointment of a very long relationship. Over time most people see us at least five to 12 times. We could basically follow a new graduate based upon how they how they progressed based on their new to review ratio.” - TL 3</i>
	Regular financial analyses to maximise profitability	<i>“If I'm doing an event which costs me money. I'll then look at how many people that actually brings into the clinic. So, the purpose of doing the event is to build the clinics further. Because that's where we generate our most income. So, if something is going to cost me \$1000, I want to see at least 10 people come into the clinic.” – TL 19</i>

	Develop strategies to employ and train appropriate staff to optimise utilisation and effectiveness	<p><i>“When you employ someone for private practice, what you need to look at other things like personality type. You know, how driven they are, whether they're hardworking, because it's not a walk in the park. Whether they're resilient. You know, good communication skills.” - TL 18</i></p> <p><i>“There should be a whole section on just like business management in the course. And be like if you are looking at doing private practice, you should do business management. Because it is so much more. The actual medical nutrition therapy is such a small part of what I do.” – TL 11</i></p> <p><i>“The biggest thing that I look at is practitioner utilisation. So, for me, we don't put a staff member on if the staff member that is already in the area isn't already 100% utilised.” - TL 6</i></p> <p><i>“Every time we get a new client, we ask him if it's OK to send them a satisfaction survey. So, and it just has one question, would you refer us to a friend? And for us, it is “yes” or “no”? And so, if that if they're not referring us to a friend, then that tells me pretty much all I need to know.” - TL – 16</i></p>
Clinical outcomes are fundamental to dietetic services	Variability in anthropometry assessment	<p><i>“Then we would look at outcomes from different patients. So, most of that was related to weight loss because we could report on that for doctors or waist circumference. Then we also did body composition using BIA.” - TL 3</i></p> <p><i>“In terms of what tools, we utilise to capture the data, just basic scales, the skin folds for the obviously certain types- more athletes.” - TL 6</i></p>

	<p>Biochemical data captured only if available</p> <p>Range of clinical data gathered</p> <p>Diet quality assessed</p> <p>Targeted use of validated nutritional indicators</p>	<p><i>“Ensuring first they have the baseline biochemistry.... And I encourage them, after three months of our dietary lifestyle intervention, to retest that.” - TL 20</i></p> <p><i>“We collect number of hours of sleep, bowel regularity, energy levels self-reported out of 10, and stress levels self-reported out of 10.” – TL 10</i></p> <p><i>“And then looking at maybe some kind of data around dietary quality. Whether that be the Australian Healthy Eating Index (HEI) survey. Or some kind of FFQ or something of that nature, where you've got some kind of broad level picture of dietary intakes at baseline and then after intervention.” – TL 10</i></p> <p><i>“Since moving into the non-diet approach, intuitive eating, health at every size world. I use the validated psychology tool, the Tylka intuitive eating scale to measure progress.” – TL 15</i></p>
Standardised, integrated systems are needed to enable routine data collection and synthesis	<p>Standardised tools are needed to support data collection</p> <p>Characteristics of standardised systems were identified</p>	<p><i>“For dietitians there is really no standardised sort of tools that we have of knowing what to do when it comes to first of all, measuring outcomes. Like what are other dietitians doing? What's effective? What's research and evidence based? So, a tool is imperative to keep dietitians in business.” – TL 20</i></p> <p><i>“It's got to be easy to use and not be demanding of a clinician's time. Because already we don't have enough time. If we now have to enter the same data twice, I don't think it would work.” – TL 18</i></p> <p><i>“I think it's very important that any data collection process doesn't impede with the patient experience.” - TL 4.</i></p>

	System outputs were described	<p><i>“If there was a way across the board, across all dietetic practices in Australia, we all captured the same data. Then that could all feed into a central database and could do some runs and get stats on that and get some really interesting findings. I think the kind of data that would be useful. It shows that dietitians can be efficacious. That seeing a dietitian works.” – TL 18</i></p>
--	-------------------------------	--